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TO CORRESPONDENTS.

Z. Y., Yarmouth.—*The chairman of the Gas Fitters' Association, Mr. Dethridge, of* 32, *Gerrard street, Soho, is the proper person to apply to for an answer to your inquiry.*

F. C., Fleet-street.—*Flintoff's present address is, we believe,* 14, *Basnett-street, Liverpool, where, under the title of "The Liverpool New Gas Company," he is attempting to repeat his Sheffield experiment upon public credulity.*

NOTICES.

The subscription is 10s. per annum if paid in advance, or 12s. on credit, payable in two sums of 6s. each, due in June and December of each year. All subscriptions commence from the 10th of January.

All Communications and orders for Advertisements to be addressed to the Editor, No. 3, Parliament-street, Westminster.

The offices of the Editor of this Journal are removed from No. 32, *Bucklersbury, to No.* 3, *Parliament-street, Westminster.*

Circular to Gas Companies.

There is a class, amongst the managers of gas works who consider photometrical gas testing as one of the simplest and easiest of philosophical investigations, and are, consequently, led by their temerity and want of experience into egregious mistakes and blunders. Dr. Letheby, on his first *début* as "gas tester" to the City of London, fell into this trap; and Mr. Newlands, the engineer of the borough of Liverpool, has followed him, under the circumstances detailed in the report of some proceedings at Liverpool, which will be found in another column. Mr. Newlands, however, has had the good sense and honesty to admit his mistake; and, though it is not stated how the errors arose, there can be little doubt that a want of due caution in ascertaining the accuracy of the registration of the meter was one of the causes. An instance lately came under our notice, where the experimental meter was found to be 12 per cent. fast; and, on examining the water-level plug, more than ten cubic inches of water overflowed from it. Photometrical observations require all the care, and are liable to even more sources of error than astronomical. Perfect accuracy in the measurement of time, and of the gas consumed, and of the spermaceti or wax burnt, as well as uniformity of pressure in the gas, are all indispensable accompaniments to a conclusive photometrical experiment; and the want of caution in any one of these respects destroys the value of the whole. Mr. Newlands neglected some of these, and came to the conclusion that the Liverpool Gas Company were supplying gas inferior in illuminating power to that contracted for. So far as he is concerned, he has fairly admitted his error; but Mr. Flintoff, and some of the discharged staff of the Sheffield Gas Consumers' Company, have availed themselves of the circumstance to attempt to sow discord been the Liverpool Company and its consumers, but apparently without the remotest chance of success. The ex-Fleet-street scholastic and clerical agent, and vender of questionable publications, is now too well known to obtain any credit for his new scheme.

In the Liverpool affair we have proof of the propriety of the course adopted by the committee of the City of London Gas Company, in asking to be furnished with the details of his experiments, when Dr. Letheby reported unfavourably upon the quality of their gas; instead, however, of complying with this reasonable request, the 21-grain-oil-of-vitriol bugbear was launched, in order, apparently, to draw off attention from the real question at issue, by starting a fresh subject for discussion. The gross exaggeration connected with this monstrous affair has, gradually indeed, dwindled into insignificance, even according to Dr. Letheby's reports; and it has become pretty evident that, exactly as the skill and knowledge of the chemical operator increases, the oil of vitriol diminishes. The last experimentalist upon the subject (Dr. Normandy) has detected, as he thinks, a very small quantity, even when employing the identical apparatus and process of Dr. Letheby, which, it is superfluous for us to add, have no legitimate connection at all with the question of what arises from gas when consumed by the public. Dr. Normandy seems to have arrived much too hastily at his conclusions; and, from a letter which will be found in another part of our columns, it is now clear that he has himself discovered the erroneous nature of several of his statements. In his first letter he told us, his earliest results were "objectionable, on account of the possible transformation of sulphurous into sulphuric acid," during the process of analysis. This, of course, raised the question, whether sulphurous acid did or did not become converted into sulphuric acid during the process. Dr. Normandy asserted that he tried it, and could not get "the slighest stain" indicative of sulphuric acid; tried again, it gave "not the least appearance of discoloration." Some one had asserted that it was "impossible to evaporate a solution of sulphurous acid without producing sulphuric acid"; but Dr. Normandy "begs to repeat that this conclusion is incorrect." We had witnessed a few carefully conducted experiments on this matter, and had fully satisfied ourselves that Dr. Normandy was quite wrong; we, therefore, testified according to our knowledge; and now it would appear that Dr. Normandy has discovered our correctness and his own error, for he tells us, what in no way diminishes his previous inaccuracy, viz., "that the black stain we noticed was due to the conversion of the sulphurous into sulphuric acid by spontaneous oxidisation," a circumstance which he previously begged "to repeat is not correct"; but how happens it that he pro-

duced "not the slightest stain"? and is he still unable to obtain, as we do, a jet-black spot? When operating upon the bisulphate of ammonia, Dr. Normandy found this, "after a few minutes," to produce only "an insignificant brownish tinge at the edges of the drop, which brownish tinge disappeared completely in the course of two hours." He now obtains "a very dingy greenish stain, which eventually becomes *black* in the centre"; and the cause of previous failure, we are informed, arose from his having employed an *impure* solution of the bisulphate of ammonia in his first experiment, though this very solution was prepared by *himself!* We are really sorry to draw attention to these things, for our notions of chemistry are associated with the idea of an exact science which cannot err. We have lately witnessed the action of pure bisulphate of ammonia upon sugar, and have seen its effects contrasted with those of a solution of sulphurous and sulphuric acids, but we have not been able to remark any such difference in the results as would warrant any person in attempting to draw a distinction. The spots are black, greenish black, and brownish black, at the edges and in the middle indiscriminately, according to the accidental proportion of sugar present in them, relatively to the matter they contain. It is to lose sight of the practical province of chemistry to strive after such vague distinctions.

Dr. Normandy desires to know "for what reasons his analysis should be objected to." We could have wished that he himself had discovered the reason. As, however, it has been very lucidly explained by our correspondent Mr. L. Thompson, in his present communication upon the oil-of-vitriol controversy, we will merely remark, that it is usual for chemists to weigh the quantity of the materials they operate upon, so as to check their results, and discover what loss has ensued during the process of analysis. Dr. Normandy has not done this, and we can assure him that on that account (not to mention his acknowledged errors in other respects) his analysis is of a kind "to which every one must in reason object."

In reply to several correspondents, who have addressed to us questions as to the expenses of obtaining an unopposed act of Parliament, we are informed by eminent parliamentary agents that they are about £400, where the share and loan capital does not amount to £50,000. The cost is the same whether the sum to be raised is £1000 or £49,999. To the above, has to be added the expenses of the local agents, which are generally inconsiderable.

Coal freights from the North have fallen during the past month, and coals are consequently from 6d. to 1s. per ton lower in the London market. Considerable difference of opinion exists as to the future; but, upon the whole, the feeling is against the probability of any considerable rise in freights. The total importations into London by sea, rail, and canal, are nearly 250,000 tons in excess of the quantity imported up to this time last year.

Several omissions have been pointed out to us in the list of patents granted for inventions connected with gas lighting, published in our issue of July last, and, as soon as a renewed examination is completed, we shall supply the omissions in a supplementary list.

LIGHTING OF THE HOUSE OF COMMONS.

In some respects the Houses of Parliament, and the House of Commons in particular, constitute a kind of engineering laboratory or experimental workshop. Novelties in architecture, in decoration, in ventilation, in warming, and in lighting, are there brought to the test of practical application for the first time; and, provided a discoverer be enthusiastic enough, and in possession of influence enough, there is nothing, however eutopian, which may not have its day of trial at these great Westminster normal assay rooms. The celebrated Dr. Reid, with his "hot and cold currents, moistened or dry," from the balmy playfulness of a zephyr to the fierce incandescence of a sirocco—he had his day; the artists who decorated the walls of the House with fantastic commentaries upon the history of England—they had their day; Mr. Leslie, with his circle of "mousetrap burners," like Saturn's luminous ring—he had his *one* day; and many, many more besides. Some persons may, perhaps, grumble at all these expensive experimental "come-to-nothings"; but yet they have their use. The process of exhaustion, though a slow one, is extremely valuable in its results; and no better proof of this can be afforded than in the present system of lighting the House of Commons. Without running back into the dreary record of past and costly failures, we will briefly describe the effects now produced, and the simple arrangements by which these are attained. There are, as is probably known to the majority of our readers, 64 openings of a quadrilateral form in the roof of the House of Commons, which openings are hermetically closed by strong sheets of plate glass; consequently, all external communication is here effectually shut off between the outer atmosphere and the air of the apartment beneath. It is through the 64 sheets of plate glass which close the openings in question that the light from the gas is made to penetrate exactly as the sun's rays pass through an ordinary skylight. Over the outside of each sheet of glass a cone, made of plaster of Paris, or some similarly white reflecting material, is fixed; this cone has its base towards the glass, and contains within its focus a concentric ring burner, or Bude light, which consumes about 9 cubic feet per hour of the highly luminiferous cannel gas supplied by the Chartered Gas Company, and furnishes at each of the openings a light equal to that of at least 50 spermaceti candles. Consequently, as there are 64 openings, the total amount of light supplied to the House is equal to 3200 candles, each burning so that it would be totally consumed in 8½ hours. The economy of the arrangement is, therefore, almost incredible, and the effect, one which requires to be seen and *felt*, rather than conceived. We would call it the perfection of gas lighting, where, as in this case, a trifling expense is of less consideration than a satisfactory result; and we quite agree with the description and opinions of a writer in the *Quarterly Review* for June last, whose sentiments, given beneath, on this subject we are not only happy to copy but also to echo.

"The House," says the writer in the *Quarterly*, "which met in a blazing afternoon, has sat out the sun, and the chamber was in a pleasant '*demi-jour*' just light enough to be comfortable to the eyes, when one of the bores began to read documents; but, as he was reading the paper very badly, the Speaker took compassion on him, and the faintest little tingle of a bell was heard. Before its sound had ceased, the House was filled with the pleasantest artificial light in the world. The flat central portion of the large ceiling was removed by the last experimentalists on the lighting of the apartment, and its place supplied with those 64 squares of ground glass, slightly painted with the floral ornaments which decorate the rest of the roof. Above this is a system of Bude lights, which kindle up in a moment; and thus, although not a lamp or a spark of fire is seen, there is sent down a supply of cool, mild, soft light, very comforting to the eyes of sexagenarians. There is another device which escapes general notice. The light we have mentioned, being above the roof, does not illuminate it, but several carved and adorned pendants, which hang down from the ceiling, bear bright lights, quite invisible to the House, and throw up their flame upon the painted roof, that would otherwise be in gloom. If Parliament should exist 100 years hence, we disbelieve, making all reverent allowance for the march of improvement, that the House of Commons will be better lighted in 1954 than it is in 1854; and, we having sat in that chamber through hundreds of weary nights, our gratitude for the present system may be accepted as a testimony to its merit."

TURF GAS.

In another part of our columns will be found a letter from M. J. Mauguin, of Paris, which is meant to be a *grave* reply to the observations contained in our last number upon the peat-gas patent of Messrs. Koechlin, Duchâtel, and De Perpigna; but whether it is not an additional argument against the project of these patentees, we leave to the judgment of our readers.

M. Mauguin begins by telling us that the patent in question is now the property of a company with a capital of 30,000,000 f.! and to this kind of reasoning we have not a word to say, for it proves the market value of the patent beyond the possibility of disputation. Taken in a proper light, 30,000,000 f. are 30,000,000 of solid metallic arguments which we have not the slightest wish to reject or refuse, but, on the contrary, bow down to with becoming deference. Nevertheless this part of the affair is really "*en dehors de la question.*" It was not the market value of the patent which we ventured to comment upon; in these respects we well know that

> "The worth of anything
> Is just so much as it will bring;"

but we had our doubts of the novelty and utility in a practical sense of the project; and, understanding a little of the

patent law of this country, as well as the practical bearing of the subject, we did think it necessary to caution the patentees in regard to that matter; and if any additional proof had been wanting to show that there was a defect of novelty in the contents of Messrs. Duchâtel and Co.'s specification, sufficient to invalidate their patent rights, M. J. Mauguin has filled in the void, and supplied that very want. In short it now appears, on the authority of M. Mauguin himself, that even Mr. Little's patent, which Messrs. Duchâtel and Co. have copied with such surprising fidelity, is in itself no novelty, but "bears a strong family likeness" to a previous patent taken out two years before! Well might we draw a comparison between "comets and patents"! In 1849, M. Moreau, comes with an idea—in 1852, Mr. Little comes with the same idea!—and in 1854, Messrs. Duchâtel, Koechlin, and De Perpigna, make their appearance with the same idea!! A periodical revolution of about thirty months, if M. Mauguin be correct in his data and in his assertions.

But M. Mauguin wishes us to believe that there is, after all, some novelty in this new peat-gas patent, and we are desired to "read it again." Well, we never asserted that it made mention of "resin, oil, or grease," and, therefore, we can have no hesitation in agreeing with M. Mauguin that it does not do so. The novelty, it appears, consists in distilling peat at a low temperature, to obtain an oil which, according to M. Mauguin, has this most desirable and marvellous quality—"*it costs literally nothing;*" and with this costless oil, the poor gas obtained from peat by distillation at a high temperature is enriched and rendered luminous.

M. Mauguin thinks it "unnecessary further to vindicate the title of the patent," and we think so too; but, in that case, the title (to speak in legal phraseology) should be changed, and instead of the words, for "Improvements in the manufacture and production of gas," there should be substituted the expression, for "A new mode of making oil which costs *literally nothing*." It may seem presumptuous to give a hint to persons capable of conceiving so admirable an invention, but, if we might do so, it would be to reject altogether the poor gas made from peat (which certainly costs something), and to make rich gas altogether and entirely from the oil which "costs literally nothing." But for this peculiarity in the oil used by Messrs. Duchâtel, Koechlin, and De Perpigna, we should have pointed out to the attention of M. Mauguin the details of two patents granted to M. Mollerat, of Dijon, in the years 1834 and 1837, for enriching poor gas, composed principally of hydrogen aud carbonic oxide, with the gas made from all kinds of "mineral, vegetable, or animal oil or grease." This, however, must be obviously a different matter, for M. Mollerat seems not to have known anything about the kind of oil which "cost literally nothing." We have invariably a grave suspicion of everything which is asserted to be so economical. It was once so with hydrocarbon resin gas, till the "nothing" turned out to be a heavy balance on the debt side of the profit and loss account of the patentee's ledger. So again with the electric light and colour project: electric currents were to be generated and maintained gratuitously, so long as the residual products were saleable at the price set upon them in the inventor's estimate; and we presume that in Messrs. Koechlin and Co.'s scheme, a large portion of the expense is expected to be repaid by the sale of peat charcoal at fictitious prices.

The inferiority of the new process over the old lies chiefly in its performing at two operations what its predecessors have accomplished with far more facility and economy at once. Mr. Lowe, by his patent of 1846, produced a gas of high illuminating power from peat direct, after saturating it with hydrocarbonaceous matter. Messrs. Koechlin and Co. take out by a first operation the little luminiferous matter which the turf contains, and then, by a second operation, give it back again to the gas; and in this, according to M. Mauguin, consists the whole of Messrs. Koechlin and Co.'s invention!

TRIAL BY JURY *versus* ARBITRATION.

We notice, with extreme regret, the increasing prevalence of a practice now carried out in our courts of law to the manifest injury of the public, and in direct violation of the constitution. We mean the system of superseding the function of our juries by sending every troublesome-looking case to arbitration. This judicially lazy plan requires to be met with by the openly expressed opinion of general condemnation. After the suitors in a cause have been put to all the expense and inconvenience of preparing their respective cases—after they have dragged together a host of witnesses, perhaps from distant parts of the country—after they have paid for a special jury—after they have fee'd counsel, and, indeed, gone through every outlay incidental to passing through the hands of the legal "harpy," "my Lud" finds the end of the term "close at hand;" by a singular coincidence, he, at the same moment, discovers that there is "a great deal of business to be got through;" and, more remarkable still, he perceives that this is a case "for arbitration," rather than "for a jury." The judge nods and hints; the counsel smile and whisper; a cluster of forensic wigs are congregated together for a few seconds; the jury wonders; the suitors expostulate, but all in vain. The farce must be played out; the special jury is dismissed, the suitors silenced, the witnesses sent about their business, the blue bags are tied up, and the matter is now in the hands of "Brother Briefless," the universal decider of all arbitration cases.

In fact, whether the parties like it or not, another trial has to be got up, more expensive and tantalising than the first. Briefless, like the painter in Peter Pindar, "never finishes" one job till another "comes in;" and, because the public resolutely refuse to employ him as a counsel, my Lord, in pure compassion, always confers upon him, when possible, the functions of an arbitrary judge. And this is the man whose dictum is to override and supplant the decision of "twelve good men and true;" this is the man for whom the constitutional rights of a mighty empire are to be suspended, if not totally set aside; this is Brother Briefless.

Perhaps some one will say, "Surely this must be a romance," or "applicable only to some other country." But it is the sad, sober truth; and, not many weeks ago, we had the misfortune to witness a pretended gas-works-nuisance case exactly in point. Nay, on that occasion the jury (a special one) had even been carried down to the scene of the dispute at a considerable cost, and no "stone left unturned" by which the matter might be elucidated, and justice secured. All, however, was in vain: Briefless triumphed, for "my Lud" had "much to do," and with Briefless the case yet rests, and will rest.

"*Sedet æternumque sedebit.*"

Communicated Articles.

THE OIL-OF-VITRIOL CONTROVERSY, AND PURIFICATION OF GAS FROM BISULPHURET OF CARBON.

By Lewis Thompson, Esq., M.R.C.S.

"The substance really obtained is not oil of vitriol at all, but sulphate of ammonia; and upon this I most unhesitatingly pledge my character as a chemist and as a gentleman."

Vide Journal of Gas Lighting, *Feb.* 10, 1854, *p.* 312.

If Dr. Letheby has not yet recanted his erroneous assertions with respect to the alleged production of oil of vitriol by the ordinary combustion of coal gas, and if he has not divulged a satisfactory process for arresting bisulphuret of carbon, it will be readily admitted that no exertions of mine have been wanting to induce him to perform both of these commendable actions. That he remains silent is, in my opinion, an additional act of injustice towards those whom he has injured, and more especially so when the accusations he has made and the hopes he has raised come to be considered by the public—accusations based upon untruth, and hopes based upon folly. So long as I was able, in charity, to imagine a proper motive, or to conceive a probable source of self-deception, connected with this oil-of-vitriol story, I heartily wished to see Dr. Letheby released from his present unhappy position—if not with credit (which was clearly impossible), at all events with the smallest conceivable amount of disrepute. Desiring only that the innocence of the accused should be established, I cared not to witness the degradation of the refuted accuser.

But this moderation on my part has not been met with that becoming repentance which the merits of the case demand. The gas interest of this great empire still cries for justice and for truth; whilst a bewildered public, smarting under the corrosive action of an imaginary acid, looks in vain for the realisation of hopes and promises that were never meant to be anything but a flight of "*canards*." Thus situated, I now mean to place in the hands of every man in the kingdom an amount of experimental knowledge sufficient to settle this vitriolic question, after which I shall take my leave of Dr. Letheby until some fresh "*gaucherie*" on his part calls for renewed exposure on mine.

Before proceeding, however, to the development of my recent researches upon gas, I will bestow a few words upon the experiments of Dr. Normandy, recapitulated in the last number of the Journal of Gas Lighting; and also upon that amiable personage, the "Irish soda-water man," who certainly deserves another calf's head; and, as poor Lefevre's kind-hearted landlord remarked,

"If I could neither beg, borrow, nor buy such a thing, I would almost steal it for the poor gentleman, *he is so ill!*"

Dr. Normandy has brought much zeal to bear upon the oil-of-vitriol question, which, it is to be regretted, seems unaccompanied by an equal amount of discretion. Thus he somewhat dogmatically regards the sugar-test as a proof that free sulphuric acid is produced by the combustion of coal gas. A pure solution of sulphurous acid in water gave him "not the least appearance of discoloration"; and the bisulphate of ammonia produced only "an insignificant brownish tinge"—in all of which particulars, I am satisfied he is totally wrong, as any person conversant with chemical manipulation can easily prove. He has made an analysis of the products condensed from the combustion of gas, but unfortunately he omitted to weigh the quantity of matter operated upon; it is, therefore, a *quantitative* analysis of an *unknown* quantity—a great curiosity, no doubt, but otherwise possessing no chemical interest whatever.

Quitting the hard road of experiment, Dr. Normandy next ventures on the easy path of speculation, and asserts that, "Whether sulphuric acid is found as one of the immediate or almost immediate products of the combustion of gas, or whether that combustion produces immediately sulphurous acid only which subsequently becomes converted by spontaneous oxidisement into sulphuric acid, does not in the least affect the practical question at issue;" but, as a warning to others, I will briefly point out the consequences of this line of argument. Although coal gas, in burning, gives off but a very small quantity of sulphurous acid, yet it yields a large amount of carbonic acid, which, as is well known, constitutes the natural food of plants; it is, therefore, almost certain that a portion of the carbonic acid generated from the gas of London is absorbed by the vegetables growing in the neighbourhood of that town; and, consequently, this carbonic acid, to use Dr. Normandy's expression, "subsequently becomes converted into" cabbages and potatoes. Are we, then, to understand that Dr. Normandy considers "cabbages and potatoes" as part of the products arising from the combustion of coal gas? That carbonic acid practically produces these vegetables, cannot be for one moment doubted, and, therefore, my argument is quite within the bounds of probability; whereas no well-informed oil-of-vitriol maker will admit that sulphurous acid is practically capable of producing oil of vitriol by "spontaneous oxidisement." In fact, this seems to be a very difficult matter; for I have kept a strong solution of sulphurous acid in a eudiometer tube, filled with atmospheric air, for three weeks, and can detect no alteration as yet in the bulk of the air; and similarly a mixture of two volumes of sulphurous acid and one of oxygen gas, both moist, have stood over mercury for six weeks without exhibiting the least symptoms of combination.

Moreover, I have been informed by one of our most experienced gas-fitters, that the tops of ordinary street lamps not unfrequently last for 25 years, though subjected, of course, to the full action of the whole of the vitriolic products of the gas. A particular "top" was lately shown to me which has lasted 20 years, and is still in use; it must therefore, in this time, have been subjected to the effects arising from not less than 400,000 cubic feet of gas; and assuming the bisulphuret of carbon in this gas at $\frac{1}{1000}$ of its weight, or one grain in every five cubic feet, something equal to 30 lb. of concentrated oil of vitriol must have passed over its surface; and yet this top is made neither of gold nor platinum.

I regret to learn that my Irish soda-water man is ceasing to abuse me, for this will not answer my purpose, and can never suit his. Honest Jack Falstaff "was not only witty in himself, but a cause of wit in others," and with a slight variation I can lay claim to a very similar peculiarity. I am not only a writer of articles myself, but a cause why articles are written by others. My effusions at "second hand" occupy in the "Milk-and-Water Journal" the same place that the "second dip" of a sheep's head does in Mr. Croll's broth: they are the pabulum or nutritious principle of the entire literary "*consommé*." Omit the "dip," and an editor dies of inanition; withhold my writings, and there is "a shop to let" in Fleet-street immediately. No, no; the editor and I are a kind of Siamese twins—my pen supplies him with broth, and I require his "foil" to set off the brilliancy of my acquirements. Like Lieut. Perry, I have a shrewd suspicion that the attack of a gang of ruffians or knaves does a man no great harm in this country, whether it originates in the brainless "*hauteur*" of a military snob, or the intense vulgarity of a low-bred and illiterate Scotch schemer. The end of such things is not difficult to predicate, and the Lieutenant and I will no doubt prove a couple of "jolly fat martyrs." "Confound this sighing and grief," says Falstaff, "it blows a man out like a bladder." I begin to *feel* that he was right. But my Fleet-street friend must continue his abuse, for I cannot do without it. He may rest, indeed, poor fellow, for a short time to refresh himself, and then again he may take it a little easier; there is no necessity for him to write as if his temper was as bad as his chemistry; nor need he every month become like a pailful of mud in a state of putrefactive fermentation—all *foam, froth, and filth*. Let him put a little salt into his broth: it will then prove less flatulent and more digestive.

Although it is an established fact that, by a very simple arrangement, an ounce of beefsteak may be cooked in such a way as to produce enough prussic acid to poison half-a-dozen individuals, yet none but a Jesuit or an idiot would, therefore, argue that beefsteaks were composed of prussic acid. Yet this has been exactly the kind of argument I have had to encounter with regard to the products arising from coal gas. Instead of burning the gas as the public burn it, it has been cooked with platinum "rosettes," or imperfectly consumed into a sooty deposition by bungling experimenters, who seem incapable of comprehending that the only question of any moment to the community, connected with things of this kind, is, "What results when beefsteaks are cooked, or gas is burnt, in the mode practised by the public at large? To bring this matter within the reach of all, I have contrived a very simple apparatus, which sets both folly and casuistry at defiance, and carries its indications home to the conviction of every reasoning being. With the burning of the gas this method has nothing to do; it is enough that gas is burnt; and whether by a fishtail, a batswing, an argand, or any other kind of burner, matters nothing in the least. Let us imagine a room lighted by gas, and inhabited in the usual way—the room may be a shop or a dwelling, or it may be a theatre or church—it may have a single burner in it, or it may have fifty or more. Having found such a room, with the single condition, that it is inhabited, or capable of being so—for without this the public could not use it—having, I say, found such a room, take a large glass vessel, of about two gallons' capacity (for instance, one of the globular vases used to contain gold and silver fish), and let it be suspended as near to the ceiling of the room as possible—but, of course, not immediately over a gasburner—and, this being done, fill it with ice. The aqueous and other condensible products generated by the gas, will now be condensed on the surface of the vase, and, running down its sides, will drop from the lower part, and may be received in a vessel (say a tumbler glass) placed in a convenient situation for that purpose. By continuing to burn the gas and to renew the ice, any quantity of watery fluid may in this way be collected, which watery fluid, it is needless to say, must be identical with that which condenses upon books, linen, furniture, &c., and which is supposed to destroy them—it must, in short, contain the condensed impurities of the air of the room. Here, then, at last we have our "imp in the bottle," and can subject leather, muslin, silk, lace, and other delicate fabrics to its action; we can steep these articles for weeks together in this fluid, and, provided we make at the same time a corresponding experiment with the water of the New River, or with rainwater, we can, after a month or so, form an opinion as to the difference, if there be any, in the result. We can also dip these articles into these several fluids or waters, and let them dry, and, in fact, we can practically investigate the whole subject without fear of chemical juggling. Nor need we stay here; for we can send the water to be analysed by a respectable chemist, without saying one word whence or how it was obtained, and we can even ask the question, "Does it contain *any* free sulphuric acid or oil of vitriol? I have analysed this water many times, and can state that, although its composition is slightly variable in strength, I have always found it uniform in its nature—it contains about five grains or rather less of simple sulphate of ammonia in every quart; *there is no free sulphuric acid whatever in it*, nor any sulphurous acid, nor does it act at all upon sugar. The apparatus to which I allude may be put up in any room or shop for 5s., and the ice required for a single experiment need not exceed the cost of 1s. more; there is, consequently, no excuse for so wealthy a body as the Commission of Sewers of the City of London to decline an investigation into the real facts of this important question. That commission, I regret to say, has most improperly lent itself to a one-sided view of the matter, and, in common honesty, ought now to establish the correctness of its previous conduct, or make such an explanation as will amount to an apology, and allay the groundless apprehensions of the public. Whether the commission will do this, I cannot say; but no man of honour can call in question the propriety of its doing so forthwith. At all events, every large consumer of gas has it now in his power to ascertain whether or not the articles in his establishment are likely to suffer injury from the effect of the gas he burns; the fluid itself can be collected, as I have shown, at a very trifling cost, and its concentrated action determined upon every description of goods.

In an investigation of this kind, requiring much time and incessant attention, many difficulties have necessarily presented themselves; but these, it gives me great pleasure to say, have been very considerably diminished by the kindness of numerous friends who have assisted me in procuring samples of condensed water from many of the metropolitan gas companies. To my friend Mr. W. J. Evans, of the Westminster Gas Works, I am particularly indebted in this respect, and also to Mr. Mann, of the City of London Gas Company, in Dorset-street. These gentlemen have constructed an apparatus, such as is described above, and, by burning large quantities of gas, have been enabled to furnish me with some pints of condensed fluid. My results are, therefore, doubly valuable, as being derived from large experiments conducted by different operators upon different gases.

Before finally closing this part of my communication, it may be as well for me to remark that I have thoroughly tested the efficiency of the above apparatus, and found it quite satisfactory. Thus, upon slowly introducing, by little and little, 10 drops of oil of vitriol into the flame of a gaslight burning in the same room which contained the apparatus, it was found that the drops of fluid which then fell

from it were intensely acid, and afforded the usual reaction of free sulphuric acid, though previously to the employment of the oil of vitriol this fluid had been almost neutral to delicate litmus paper.

Having thus disposed of this vitriolic subject, I will now offer a few remarks upon the detection of bisulphuret of carbon, and the best practical means of purifying gas from it. More than six years ago, I ascertained, for an especial purpose, that the coal gas in Paris and in London contained much about the same quantity of bisulphuret of carbon—that is, about $\frac{1}{1000}$ of its weight, or 1 grain in 5 cubic feet. The method which I then employed I have, on many occasions, made known to my friends, under the name of the "barytic plan"; and certainly it has never been regarded as, or made, a secret of by me: in fact, I have no secrets of my own. It is much superior to the ammonia method; for, independent of the possibility of loss during the operation by ammonia, there is this inevitable source of error arising out of it—that any sulphurous emanations floating in the air come to be added to and regarded as impurities contained in the gas. I have, therefore, never held out this plan as perfect, but merely as one of easy application, and sufficiently accurate to prove the ignorance of others, and the fallacy of the "rosette" system. But the baryta plan is perfect, and is put in operation as follows:—About 1000 grains of the gas, previously freed from sulphuretted hydrogen, are to be slowly passed over 200 grains of pure caustic baryta (made from the nitrate), contained in a porcelain or Bohemian glass tube heated throughout the length occupied by the baryta to dull redness. After the coal gas has passed, it must be followed by a current of oxygen gas, to burn off any deposited carbon, and oxidise the sulphuret of barium formed during the process. The tube being then allowed to cool, the baryta must be withdrawn, and digested in an excess of pure dilute muriatic acid, which will dissolve a portion of it; the insoluble residue is then to be washed, dried, and weighed in the usual manner: it is sulphate of baryta, and every 234 grains of it indicate 38 grains of bisulphuret of carbon.

The *rationale* of the above process is extremely simple: 2 atoms of oxide of barium part with their oxygen to form 1 atom of carbonic acid with the 1 atom of carbon contained in the bisulphuret of carbon, leaving 2 atoms of barium, which combine with the 2 atoms of disengaged sulphur, to produce 2 atoms of sulphuret of barium. This sulphuret of barium is then oxidised into sulphate of baryta by the current of oxygen gas. As it is impossible on the small scale to ascertain whether the coal gas during this operation loses much of its illuminating power, it was impossible for me to say how far this system of analysis may be turned to account as a means of purification; the idea of passing an easily destructible substance like coal gas through a red-hot tube did appear to me at first sight a most objectionable project, and, consequently, I allowed the matter to rest in abeyance. Having, however, through the kindness of Mr. F. J. Evans, and the liberality of the directors of the Chartered Gas Company, been placed in a position to make this investigation in a practical manner, I am happy to announce that the most complete success has resulted: the purification of coal gas from every form of sulphurous contamination is no longer a doubtful problem, but an established fact, and one, moreover, of easy application. All that is requisite is, to pass the gas, as in the case of the baryta, over a quantity of lime contained in a tube or retort heated to dull redness throughout. There is no appreciable loss of illuminative power, and the gas becomes freed from every sulphurous impurity, whilst the lime is converted into sulphuret of calcium. In conjunction with Mr. Evans (whose valuable aid in the matter I cannot too highly acknowledge) I have purified considerable quantities of gas in this way, and have consumed it with ammonia, so as to test the resulting products; and have also burnt it photometrically, to determine, by comparison against the same gas unpurified, whether it has suffered any injury; but in both instances have arrived at results proving that the process was unobjectionable.

In practising this system, a perpendicular retort, with an exit at the bottom, would, perhaps, prove most convenient; and an elliptical rather than a circular cylinder would enable the heat more readily to reach the centre of the lime. Arrangements of this kind are, however, more exactly within the province of the gas engineer than of the chemist, and each will, no doubt, devise his own. The principle is merely to pass the gas, either before or after what is called purification, over lime, slaked or otherwise, and heated to a dull red, or even much lower, so as not to injure the illuminating power of the gas. Of course baryta, strontia, potash, soda, oxide of manganese, or even ammonia, may be substituted with more or less propriety for lime; nay, even the vapour of water or steam, passed with the gas through a red-hot tube or retort, will answer the purpose, as, in this case, the water and bisulphuret of carbon mutually decompose each other—two atoms of water and one atom of the bisulphuret giving rise to one atom of carbonic acid and two atoms of sulphuretted hydrogen. When conducted in a red-hot copper tube, this is a beautiful experiment, as illustrating the nature of the decomposition. All or any of these methods may, of course, be applied on the small or domestic scale in a common kitchen fire, fitted with a proper tube, so that the gas, in travelling from the meter to the burner, may pass through this tube, when red hot, and filled with any of the chemical reagents above enumerated; or, when steam is used, with small pieces of brick or pumice-stone, previously steeped or not in a solution of the muriate of platinum.

It is, as I have before remarked, not requisite that the gas should have been freed from its sulphuretted hydrogen, before being submitted to this process; lime equally well arrests at a red heat the sulphuretted hydrogen as the bisulphuret of carbon, and in both cases sulphuret of calcium is produced, which differs from the hydrosulphuret of lime formed during ordinary purification, by being without odour, and not liable to atmospheric decomposition. When exposed to the air at a red heat, it readily burns into sulphate of lime, and is then extremely useful as a luting.

There is, however, a fact connected with the gas thus purified which requires notice—it is almost entirely devoid of smell; consequently the usual warning in the case of leakage is not given; this is a very grave inconvenience, and one which must not be lost sight of. No doubt the various volatile bases to which, in derision of what is called "organic chemical nomenclature," I have given the name of "smoke-ole," are destroyed by the action of the lime, and this, together with the removal of bisulphuret of carbon, renders the gas inodorous. Although I have thus devised a process for thoroughly purifying gas, yet in my opinion it is a work of supererogation; the products, except carbonic acid, arising from the ordinary combustion of this agent being, as I have already shown, quite harmless.

Correspondence.

KIRKHAM'S WATER GAS.

Sir,—Although the few lines you published in this month's Journal of Gas Lighting, with regard to the trial about to be made of Mr. Kirkham's water gas at the Hospital of the "*Invalides*," are strictly correct, I have been since informed that the prohibition is not definitive, but temporary, pending a chemical investigation into the quality of the gas produced by the apparatus now in course of erection; and that, if a satisfactory report is received, the interdiction will in all probability be removed. Enclosed is an extract from the report of M. Pelouze, to which I referred; and, as he has authorised its being made public, perhaps you will do so through the columns of your Journal.

Paris, Aug. 28, 1854. M.

Extrait du Rapport de M. Pelouze *au Conseil Municipal de Paris, dans les Séances des* 24 *et* 28 *Juin*, 1854.

GAZ KIRKHAM.

L'usage de ce gaz devrait encore être sévèrement interdit, et pour le prouver il suffira au rapporteur de citer le passage du procès-verbal de votre troisième séance, où est reproduite l'opinion émise devant la Commission par M. Dumas.

"L'oxyde de carbone, dit M. Dumas, est un gaz connu depuis le commencement du siècle, et pendant nombre d'années personne ne songea à attribuer à ce gaz des propriétés vénéneuses, qui n'avaient été soupçonnées par aucun savant. Ainsi lorsqu'on proposa, il y a quinze ans, d'employer le gaz à l'eau pour l'éclairage et pour le chauffage, je n'hésitai pas, je dois le reconnaître, à conseiller dans mes cours de faire des expériences dans ce cens. M. Selligue s'empara de cette idée, fit du gaz par la décomposition de l'eau dans l'usine de Batignolles, et le rendit éclairant au moyen de l'huile de schiste. M. Selligue était loin de savoir, et personne ne savait alors que ce gaz fût vénéneux. C'est plus tard que cela fut reconnu par M. Leblanc dans mon laboratoire, où nous fîmes des expériences décisives. Il fut vérifié qu'un mélange de 1 per cent. d'oxyde de carbone tuait un chien de forte taille en une minute et demie. C'était un empoisonnement. Avec 1 per cent. d'oxyde de carbone tous les animaux étaient tués en quelques minutes. Ce sont là les expériences qui m'ont le plus effrayé; depuis lors elles ont été répétées nombre de fois par divers savants. Il ne faut pas confondre l'oxyde de carbone avec l'acide carbonique. Dans le cours des expériences dont je viens de parler, on avait formé une atmosphère artificielle avec 30 per cent d'acide carbonique, un gros chien y avait été placé, presque aussitôt il tomba sur le flanc; mais rendu à l'air libre, il revint à la vie: 30 per cent. d'acide carbonique n'ont pu tuer, 1 per cent. d'oxyde de carbone au contraire est mortel. Je suis donc convaincu que cet oxyde a les plus grands inconvénients, surtout appliqué à l'éclairage.

"M. Selligue croyait avec la plus entière bonne foi à l'excellence et à l'innocuité de son procédé; il a éclairé ainsi une partie de la ville de Strasbourg. Une nuit le gaz ayant pénétré dans une boutique, quelques personnes en sont mortes. C'est là le premier indice des propriétés vénéneuses de ce gaz. Quelques temps après, M. Dupuis Delcourt voulut faire une ascension en ballon, et au lieu de prendre le gaz hydrogène, il fut forcé, par un accident, d'employer le gaz Selligue; le ballon fut gonflé; au bout de quelques instants l'aéronaute tomba asphyxié dans sa nacelle. Le ballon descendit à terre; M. Dupuis Delcourt reprit ses sens, mais les personnes qui s'étaient approchées du ballon pour venir à son secours étaient elles-mêmes tombées évanouies.

"On a reconnu plus tard que l'oxyde de carbone des hauts-fourneaux pouvait être recueilli et constituait une matière

utilisable; lorsque les ouvriers des forges le respirent, ils sont frappés et tombent: il y a des centaines d'exemples de ce genre d'accidents, toujours passagers parce qu'ils ont lieu en plein air.

"Il est impossible d'admettre qu'un gaz produisant de tels effets puisse être employé dans un lieu fermé, dans une boutique ou dans un théâtre."

Telle est l'opinion de l'honorable président de la Commission, et si l'on considère que le gaz extrait de l'eau par le procédé de la Compagnie l'*Alliance*, contient jusqu'à 30 per cent. d'oxyde de carbone, l'on peut arriver à se demander, comme j'avais l'honneur de le faire observer dans la dernière séance, s'il y a lieu d'approuver des expériences ayant pour résultat la fabrication d'un gas contenant une proportion aussi considérable de substances vénéneuses.

Nous ne pouvons pas, Messieurs, encourager par le silence une fabrication aussi dangereuse, et c'est avec grande raison qu'un de nos collègues disait, dans une de nos précédentes séances, que des notions de cette nature seraient très utilement publiées, parce qu'elles ne sont pas généralement connues.

Il faut conclure de tout ceci que le gaz extrait par le procédé de la Compagnie l'*Alliance*, non-seulement ne doit pas être appliqué à l'éclairage d'une grande ville, mais que son usage même privé devrait être sévèrement défendu.

(TRANSLATION.)

Extract from the Report of M. PELOUZE *to the Municipal Council of Paris, in the Sittings of June* 24 *and* 28, 1854.

KIRKHAM'S GAS.

The use of this gas should also be severely forbidden, and to prove it your reporter need only cite the passage from the *proces-verbal* of your third sitting, in which is reproduced the opinion emitted before the commission by M. Dumas:—*

"The oxide of carbon," said M. Dumas, "is a gas known from the commencement of the present century, and for many years no one thought of attributing venomous properties to it—no man of science suspected it. When, therefore, fifteen years since, it was proposed to me to employ water gas for lighting and heating, I must acknowledge I did not hesitate to advise, in my course of lectures, the making of experiments in this direction. M. Selligue appropriated to himself this idea, and made gas by the decomposition of water in the works at Batignolles, and rendered it luminiferous by means of oil of schist. Neither M. Selligue nor any one else then knew that this gas was poisonous: that was discovered later by M. Leblanc, in my laboratory, and we made some decisive experiments. It was proved that a mixture of 1 per cent. of oxide of carbon killed a strong dog in a minute and a half: it was a case of poisoning. With 1 per cent. of oxide of carbon, all animals died at the end of a few minutes. These experiments terrified me. Since then they have been repeated many times by different men of science. Carbonic acid must not be confounded with oxide of carbon. In the course of the experiments of which I have just spoken, I formed an artificial atmosphere with 30 per cent. of carbonic acid. A large dog, on being placed in it, almost immediately fell on his side, but recovered himself on being restored to the pure air. Thirty per cent. of carbonic acid did not kill; but, on the contrary, 1 per cent. of oxide of carbon is mortal. I am, therefore, satisfied that this oxide has the greatest inconveniences—above all, when applied to lighting.

"M. Selligue believed, with the most entire good faith, in the excellence and in the harmlessness of his process. He lighted a part of the town of Strasburg: one night the gas penetrated into a baker's shop, and several persons died. This was the first proof of the poisonous properties of this gas. Some time afterwards, M. Dupuis Delcourt was desirous of making a balloon ascent, and, instead of taking hydrogen gas, he was obliged, by an accident, to employ the gas of M. Selligue. The balloon was inflated; at the end of some seconds the aëronaut fell suffocated in his car. The balloon descended to the earth, and M. Dupuis Delcourt recovered his senses, but the persons who approached the balloon to give him assistance themselves fainted and fell.

"It has been since found that the oxide of carbon of blast furnaces may be collected, and constitute useful fuel; but when the workmen of the forges breathe it, they are struck, and fall. There are hundreds of examples of this sort of accidents, always transitory, because they take place in the open air.

"It is imposible to admit that a gas producing such effects should be employed in any close apartment, in a shop, or in a theatre."

Such is the opinion of the honourable president of the commission; and, if it is considered that gas extracted from water by the process of the company "*l'Alliance*" contains as much as 30 per cent. of oxide of carbon, we may ask, as I had the honour to observe in the last sitting, whether there is any cause to approve of experiments resulting in the manufacture of a gas containing such a proportion of poisonous substances?

We cannot, gentlemen, by our silence encourage so dangerous a manufacture; and it was with great truth that one of our colleagues said, in one of our preceding sittings, that notions of this nature would be very usefully published, because they are not generally known.

It must be concluded from all this that the gas of the company "*l'Alliance*" should not only not be applied to the lighting of a large city, but that even its private use should be severely forbidden.

* The distinguished professor of chemistry and member of the French Institute.

DR. NORMANDY ON THE IMPURITIES IN COAL GAS.

SIR,—The last number of the JOURNAL OF GAS LIGHTING contained, in the "Circular to Gas Companies," a few observations on my article on the "Impurities of Gas," published in the same number; on which observations you will, perhaps, allow me to make a few remarks, inasmuch as they were, doubtless unintentionally, worded in a manner calculated somewhat to mislead such of your readers as may not be conversant with chemical matters, respecting the reactions indicated in my article, the opinions I ventured to express, and the analyses on which I grounded those opinions.

Thus, by saying that you had yourself witnessed sulphurous acid to produce a black stain similar to that formed by free sulphuric acid, some of your readers will or may infer (and I know that some have actually done so) that both acids give this reaction; whereas, on the contrary, in the case which you witnessed, the black stain produced was due to the conversion of a portion of the sulphurous into sulphuric acid by spontaneous oxidisation—the latter acid *alone*, I beg again to assert, having the characteristic property, when in a free state, of blackening a solution of sugar of suitable strength.

Neither do I really think (pardon me for saying so) that because ammonia is a volatile substance, and because the quantity of this substance which I found in the gas on which I operated was small, that it necessarily "*implied*" some loss in my analysis. Any person who will read with moderate attention the description of the process I employed, will see that the ammonia evolved by the distillation of the liquid in question with potash, had to traverse a bulb-condenser charged with a large excess of test sulphuric acid, and that it was, therefore, absolutely impossible that even "the one-tenth of a grain"—which, as you say, "would totally destroy my conclusions"—could have escaped being arrested, notwithstanding the "well-known volatility of that substance." Until, therefore, the analysis of another chemist has actually proved that a quantity of ammonia sensibly greater than I found exists in the same description of gas as that on which I operated (allowance being, of course, made for variations in the manufacture of that commodity), I respectfully conceive that my results must remain undisturbed.

When, by following Mr. Lewis Thompson's process for the detection of the quantity of sulphuric acid which *may be had* from 100 cubic feet of gas, I found 49·63 grains of that acid in the Imperial gas of the Pancras station, it is quite clear that this result fully corroborates Mr. Lewis Thompson's experience; but how this can be made to prove that the Imperial gas is worse than the average instead of better, as "*incorrectly argued by me*," I am at a loss to imagine, seeing that I have argued nothing of the kind. I simply stated—

That by merely condensing the water resulting from the combustion of the Imperial gas in the usual manner, and testing that water, I found it to contain only half the amount of the "alkaline impurity" of the Great Central, and 8, 11, 12, and 13 times less sulphuric acid than found by Dr. Letheby in the City cannel, the Great Central, the City Company, &c., when submitted to the same treatment.

That on testing the gas of the Imperial Company precisely in the same manner as described by Dr. Letheby, and with this gentleman's own apparatus, the quantity of sulphuric acid produced was considerably less than found by him in the gas of other establishments mentioned in his report.

That was all.

As to the quantity of sulphuric acid which 100 cubic feet of gas may be made to yield, when submitted to Mr. Lewis Thompson's mode of treatment, as I did not apply this mode to any other gas than that of the Imperial, *I could not and did not* argue either correctly or incorrectly about its being a better or a worse gas, since, as I just said, I have had no opportunity whatever of submitting the gas of other companies to that treatment, and therefore no means of establishing a comparison.

There is certainly no doubt but that by Mr. Lewis Thompson's process a greater quantity of sulphuric acid can be obtained from a given quantity of gas than by following that proposed by Dr. Letheby, whose object, possibly, was not to ascertain how much of that acid could be produced, but simply to discover how much of it was really given off by burning it (as he himself expresses it) *exactly as the public consume it.* Whether or not Dr. Letheby's apparatus complied with his own condition, is a thing which, at present, does not concern me in the least; but when you say that the analysis by which I computed that 1·275 grain of sulphuric acid were contained in 100 cubic feet of gas, is an analysis "*to which every one must in reason object*," I think it is but fair that you should say in what way, and for what reasons, my analysis should be objected to.

Were I not obliged to leave London to-morrow for the Continent, I should doubtless have completed some experiments on which I

have been engaged on this subject, in time for your present number; as it is, you will perhaps favour me with a corner in your next number, for the remarks which a further investigation of the subject has suggested to me.

Allow me, however, at once to rectify a statement which I made in one of the paragraphs of my former article. I allude to that part where I said that a concentrated solution of bisulphate of ammonia, when submitted to the sugar test, produces only an insignificant brownish tinge at the edges of the drop, but no black stain as is the case with free sulphuric acid.

My grounds for this statement were, that after having weighed one equivalent (66 grains) of the neutral sulphate of ammonia of shops, mixed with it less than one equivalent (or about 40 grains) of oil of vitriol, and boiled the whole together, I found, on submitting to the sugar test several separate drops of the extremely acid liquor resulting from the above mixture, that the reaction produced was, as I said, a fugitive stain of a drab colour, instead of a permanent intensely black stain, as would have been the case with free sulphuric acid.

The object I had in view in adding less than one equivalent of sulphuric acid to the equivalent of neutral sulphate, was to guard against the chance of having an excess of sulphuric acid. The above-mentioned liquor consisted, therefore, of a large quantity of bisulphate of ammonia mixed with, or as it were purposely contaminated by, some neutral sulphate; and, as I failed in obtaining with it the black stain in question, I concluded that bisulphate of ammonia had no power to decompose sugar, as is the case with sulphuric acid. I have, however, ascertained since that a comparatively small quantity of neutral sulphate, and in fact, I believe, of any other neutral salt, may singularly interfere, or even altogether prevent, the production of the black stain alluded to. I therefore operated in another way, as follows:—

I very accurately weighed 200 grains of dilute sulphuric acid (1 of acid and 3 of water) into two separate portions of 100 grains each. To one of these portions I added an excess of ammonia, and allowed it spontaneously to evaporate until the liquor left had acquired the acidulous reaction of the neutral sulphate of ammonia. I then added thereto the second portion of 100 grains of dilute sulphuric acid kept for that purpose, and evaporated the whole by means of a steam bath until nothing but a crystallised mass was left in the capsule. I then dissolved the mass in pure distilled water; and on submitting a few drops of this liquor to the sugar test, I obtained, instead of a black, a very dingy greenish stain, which eventually became black in the centre, but the edges of the drop remained greenish. With sulphuric acid, on the contrary, the edges of the drop always become black first, which is never the case with solution of bisulphate of ammonia, however concentrated.

A. Normandy.

67, *Judd-street, Brunswick-square, Aug.* 28, 1854.

PEAT GAS.

Sir,—You gave admittance, in your last number, to an article on peat gas, in which Messrs. Duchâtel, Koechlin, and de Perpigna's patents are very severely handled. These patents are now the property of a company founded with a capital of 30,000,000 f. (£1,200,000 sterling) under the name of de Perpigna and Co.

From your account, these patents are neither new nor useful; and an ignorant enthusiast alone could dream of making use of peat wherever coal was to be had. I must protest, in the name of these gentlemen, against such a verdict; and allow me to add, in my own, that one must feel very confident in one's own powers, to define in such absolute terms the limits of human industry. What discovery ever made its way without contest? Peat gas forms no exception to this rule; and I do not despair of including you soon amongst its most zealous partisans. I shall not attempt to bandy pleasantries with the writer of the paragraph; on this score I humbly acknowledge myself vanquished: but a serious purport lurks at the bottom of his witty attacks, and to this I shall direct my answer.

The first objection he raises to our patents is, that they are not new, and that they are but a mere compilation from those of Messrs. Lowe, Evans, and William Little. Nothing frequently misleads more than partial quotations; details bearing a certain resemblance to each other are put forward, and a general conclusion of identity jumped at erroneously. One might, with as much accuracy, conclude that all men are alike, because every man has a head and two feet. Have you carefully read our patent? Have you read it with sufficient attention to be quite sure that no essential point has escaped your notice? I think not; and, if you will allow me, we will examine it together. But, first, I beg to note your declaration, that Mr. Lowe's patent has been tried on a great scale at Amiens, and that his process appeared to you at first so rational that you were very favourably disposed towards it; but that the affair failed in a pecuniary point of view, or, in your own words, "it did not pay." Hence I conclude that the fabrication in itself offered no serious obstacle, but that the cost of the gas thus produced was the sole cause of its non-success. Whence this commercial failure? Why is peat gas so dear? Merely because, as you imply, Mr. Lowe, and all his predecessors and successors (ourselves excepted), did not make peat gas, but merely a gas extracted partly from peat, partly from resin, tar, oils, greases, &c. Herein lies the secret; for, amongst all these ingredients, the only available ones are expensive, and add very considerably to the cost of the gas. But why these extraneous and costly materials introduced in the manufacture of peat gas? Simply because peat gas did not by itself give a sufficiently powerful light, and that it was found necessary to augment its power by mixing it with a richer but also a more expensive gas. If, then, peat gas has not answered in a commercial point of view—if its prime cost has always been too high—it has not been owing to the peat in itself, but to the expensive adjunction of extraneous substances considered necessary to increase the lighting powers of peat gas, too poor in itself.

Now, be so good, sir, as to read over our patent with me. You will find there no mention whatever of resin, oil, grease, or any other ingredient used for carburetting gas; for, in fact, we find in peat alone the necessary elements for our manufacture, for which we only require the essential oil derived from the peat itself by means of distillation effected in a special manner. We thus obtain a gas giving twice as much light as that extracted from coal, and not dearer than the poor gas formerly derived from peat. The fabrication in itself is, as you admit, a simple one; and, in a commercial point of view, we are in a totally different position from Messrs. Lowe and Evans, since our peat oil, which costs us literally nothing, stands us in lieu of those oils and greases which formed the chief items of expense in their system. It is unnecessary further to vindicate our title to the patent, and to dwell more fully upon the important feature which distinguishes ours from those of Messrs. Lowe and Evans, and, indeed, from every previous patent. We arrive at a result which no one else has ever yet attained; and you will, therefore, admit with me, that we have probably employed new means to obtain this new result.

Now, as to Mr. William Little's patent. It treats of greases applied to railway uses—a matter of little or no interest to a gas manufactory; and you might have spared us the accusation of plagiarism, and would, doubtless, have done so, had you been better acquainted with the history of Mr. Little's patent.

I must now beg you to refer, not to 1852, but to 1849, and you will find another patent taken out for the same purpose, which bears a strong family likeness to Mr. Little's; and when you learn that M. Moreau was the inventor of the process specified in this patent of 1849, that Mr. Little was one of the parties interested in that concern, and that, moreover, M. Moreau is the inventor of the process now employed by Messrs. de Perpigna and Co., you will easily trace and account for the filiation which has produced the resemblance you have been pleased to remark.

I hope, sir, that this concise defence of peat gas will obtain at your hands the same publicity that your attack has received.

Paris, Aug. 29, 1854. J. Mauguin.

Register of New Patents.

David Hulett, for "*Improvements in gas regulators for regulating the supply of gas to the burner.*" (Partly communicated.) Patent dated Jan. 4, 1854.

The object of this invention is to regulate the supply of gas from the main to the burner, in order to prevent fluctuation in the height of the flame, notwithstanding any difference that may occur in the pressure of the gas in the main.

The inventor proposes, by means of a self-acting mechanical arrangement, to regulate the flow of gas into the burner with the utmost nicety, and to secure a steady and uniform light for any length of time.

This regulator consists of a cast-iron vessel, with inlet and outlet passages for the admission and emission of the gas. The inlet is covered by a valve, the edge of which dips into a groove containing mercury. This renders the joint perfectly gas-tight, without impeding the motion of the valve, which is hinged in such a manner as to move without the slightest variation of pressure. The valve is attached by a rod to a cylinder, the lower part of which is open, and dips into a channel or groove containing mercury. The cylinder covers and surrounds the inlet passage. Thus, as the gas flows from the main through the inlet of the regulator, it exerts an upward pressure on the cylinder, which is so adjusted as to admit the requisite quantity of gas for the supply of the burners.

If the pressure of gas issuing from the main be increased, it lifts the cylinder which closes the valves; but the consumption by the burner quickly reduces the pressure within the regulator, and this causes the cylinder to fall and open the inlet passage.

The inventor claims for this apparatus for regulating the flow of gas.

Rev. William Renwick Bowditch, Wakefield, for "*Improvements in the purification of gas, and in the application of the materials employed therein.*" Patent dated Jan. 10, 1854.

This invention relates to the mode of purifying coal and other gases, employed for the purpose of illumination, by the aid or employment of clay or aluminous earths, applied either alone or with the addition of lime, together with the application and use of the clay or other earths, when impregnated with ammonia or other nitrogenous compounds from the gas, as a manure or fertilising agent.

The agents referred to are used either in a dry or wet condition, and either alone or mixed with cinders, gravel, sawdust, or other convenient materials to render the mass porous, and the crude and unpurified gas is then passed through it, or brought into close contact with it.

By this treatment the inventor says he can remove, more completely than his hitherto been done, the injurious matters contained in the gas, viz., carbonic acid, ammonia, sulphuretted hydrogen, cyanogen, bisulphuret of carbon, and the compounds of those several matters.

The purifying material used is clay or aluminous earth, red or yellow clay being preferred, more especially after it has been subjected to the disintegrating action of rain, and the natural changes of temperature.

The clay or earthy mass used for this purpose is best prepared for its office by drying it in the open air, or by the agency of artificial heat not higher than about 212° of Fahrenheit. It is pulverised by beating or grinding, and then moistened with water until it attains the consistency of what is technically known in gas manufacture as dry lime, and is capable of being formed into a ball in the hand by gentle pressure.

When this prepared and purifying material is spread out, to a depth of from four to six inches, upon trays, riddles, or shelves, in the scrubbing or purifying vessels, the crude gas is thus made to pass through those purifying layers in the manner commonly adopted in the dry-lime purification of coal gas. The purifying vessels containing the clay or aluminous earth are alternated in dry-lime purifiers, the lime and clay being used in about equal proportions; but the gas under treatment ought to be passed through the clay purifier at the termination of the series. The number and size of these purifiers must depend upon the quantity of impurities in the gas, the quantity of lime being generally the same as that now used in dry-lime purification.

Instead of using separate clay and lime vessels alternately, the patentee prefers using alternated layers or strata of clay and lime disposed in each purifying vessel, the final purifying layer being clay.

The inventor then recommends that the gas should be passed through a scrubber placed between the condenser and the purifiers, this scrubber containing clay spread upon riddles or trays, and either mixed or not with breeze or other porous matters, to facilitate the passage of the gas, and also through a vessel of a similar nature placed in the line of the outlet main communicating between the gas works and the consumers.

This last cleanser is used for the removal of any impurity which may have been but partially removed by the purifiers, or which may have passed into the gasholder with the unpurified gas.

The spent clay, after having purified the gas, is removed from the purifiers, and spread out and exposed to the action of the air, when part of the absorbed impurities are volatilised; and the clay, being thus partially cleansed, may then be used over again three times with efficiency.

If the wet-lime system of purification is to be used in combination with this clay process, then the purifying manufacture is to be mixed with water until the mass attains the consistency of what is well known in the gas manufacture as wet lime; such moistened matter is applied in the purifying process in exactly the same manner as wet lime, and alternately with it—the quantity of wet lime being the same as is usually employed.

The inventor also proposes to apply this process to the purifying of gas on the premises of the consumer, in a vessel called the domestic purifier, made of iron or other materials.

The patentee claims the purification of coal and other illuminating gases by the use of clay or aluminous earth, employed either singly or in combination with lime, in the manner described; and also the employment of clay or aluminous earth as a manure or fertilising agent, after the same has been used in the purification of gas.

Rev. William Renwick Bowditch, Wakefield, for "*Improvements in the consumption of fuel, and in the more economical production of light and heat.*" Patent dated Jan. 10, 1854.

The object of the invention is to economise fuel, as applied to furnaces and boilers; and also to obtain a greater amount of light in lamps than can be obtained from a given quantity of gas or oil by the arrangements at present in use.

The inventor proposes to effect this by means of a furnace so constructed that the air necessary for the purpose of combustion may be introduced through a flue or flues situated alongside or beneath, or otherwise in connection with, the furnace, and finally introducing the air upon the burning fuel in a highly heated state at the end of the furnace nearest to the door. Before the fuel is introduced, it is to be placed in an opening somewhat similar to that of the mouthpiece of a gas retort; and when it is heated there, it is gradually pushed along to the further end of the furnace, by which means the fuel at the end of the furnace is always in an incandescent state.

These improvements are applicable to the construction of common fire grates and stoves, in which case the grates would be formed with a series of tubes, or with a chamber communicating with the air outside, or with the interior of the room behind the fire—the ashpit being a closed chamber.

This part of the invention is applicable to the consumption of oil as well as gas in lamps. By passing the air for combustion between two glass chimneys, the outer one of which rests upon the glass or metal bottom, fitting air-tight at its junction with the gas pipe or burner, and the air is, consequently, caused to pass over to the top of the outer glass, and to descend between it and the inner glass, and through the space at the bottom into the flame, which it reaches in a highly heated state.

The inventor also proposes to place inside the boilers (for the further economisation of fuel, in connection with his improved furnaces for the generation of steam) a series of thin upright pieces of copper or other metal, pointed at both ends, joined together, and rising from the boiler plates or tubes into the water. With this modification, the water is heated more rapidly and with less amount of fuel than is required for ordinary boilers.

The inventor claims—

For the application and use of an external shade or chimney for heating the air supplying gas lights or lamps.

For the air-heating chamber; and

The use of thin double-pointed pieces of metal in boilers.

Henry Beaumont Leeson, M.D., Greenwich, for "*Improvements in gas-burners.*" Patent dated Jan. 11, 1854.

The object of this invention is to obtain a more convenient means of combining air with gas in a gasburner. For this purpose the burner is constructed with numerous small passages at the upper part, where the gas mixed with the air is burned. The burner is hollow, and the lower part is open, but capable of being closed, more or less, by a conical or other similar form of valve on the top, which introduces the gas to the hollow chamber of the burner. The burner is made capable, by means of a screw, of rising or falling so as to regulate the quantity of air which is permitted to flow into the hollow chamber of the burner.

The inventor claims the peculiarity of the combination of parts constituting the "mixing chamber."

John Bethell, 8, Parliament-street, Westminster, gentleman, for "*Improvements in manufacturing coke.*" Patent dated Jan. 12, 1854.

The patentee states that his improvements consist in making coke by mixing with coals, or small pieces of coke, the pitch obtained from coal-tar, and then burning the mixture into coke in the well-known coke ovens, or in heaps; and also by making coke from burning pitch only, in a coke oven. The pitch is broken into small pieces, and well mixed with the coals, and then this mixture of coal and pitch is burnt in the same manner as coals are now burnt in making coke; and when pitch only is used, the lumps of pitch are thrown into a hot coke oven, and burnt into coke in the same manner as coals are now burnt to make coke. Many coals that will not alone produce a good coke, will, when mixed with pitch as above directed, make a very good coke; and all the small pieces of coke, which are too small to use, will, when mixed with pitch and burnt again, produce a good coke.

The proportion he recommends to be used is one ton of pitch mixed with four tons of coal; but this proportion may be varied at pleasure, according to the quality of the coals used.

The patentee claims as his invention the making of coke from pitch alone, or from a mixture of coals and pitch, burnt as described.

Cyprien Marie Tessié du Motay, chemist, 24, Rue Fontaine St. George, Paris, for "*Improvements in manufacturing oil from resin.*" Patent dated Jan. 21, 1854.

This invention consists of improvements in obtaining oil from resin, and in treating such oil. For this purpose, resin is placed in a still with hydrate of lime or alkali, and distilled over. The oil obtained is mixed with hydrate of lime or alkali, and again distilled. The oil is then subjected to the action of sulphuric acid; and it is allowed to settle, and the oil run off or separated. The oil is next distilled mixed with charcoal (animal or vegetable), or with charcoal and carbonated alkali. The oil is filtered through animal charcoal or other suitable matter. The residual matters are made into lubricating materials.

The patentee thus describes the stages of his process:—

1. He distils the resin, either alone or, by preference, mixed with about ten per cent. of hydrated lime or alkali, and in this manner he obtains an oil.

2. He mixes the oil thus obtained with from 10 to 20 per cent. of hydrated lime, and again distils.

3. The oil obtained by this second operation is agitated in a suitable apparatus with from six to ten per cent. by weight of sulphuric acid of commerce, after which the liquids are allowed to separate, and a substance like tar sinks to the bottom of the vessel. The oil, which floats on the surface, is drawn off and again treated in the same manner with sulphuric acid in the proportion of about four or five per cent.; when the liquid is again separated—generally at the end of twelve or eighteen hours—the oil is again drawn off from the precipitated tar.

4. The oil is mixed with from five to ten per cent. of animal charcoal, or a mixture of charcoal; and the carbonate of either the alkali or vegetable charcoal may be used in place of animal charcoal, but he considers animal charcoal preferable.

5. The oil obtained is filtered, by preference, through a bed of animal charcoal, but other filtering material may be employed. In place of treating the oil with sulphuric acid as above described, the oil may be purified by again distilling with from 10 to 15 per cent. of chloride of zinc.

After the distillation of lime, there remains in the vessel a mixture of lime oil. This substance he mixes with the tar resulting from the action of sulphuric acid, and with a small quantity (say from 10 to 15 per cent.) of resin oil, so as to obtain a substance of a suitable consistency, and which he uses for lubricating machinery; or the grease may be formed by dissolving the lime residue in resin oil, and quick lime may be added in quantities sufficient to obtain the desired consistency.

The patentee also describes two forms of lamp which he considers suited for burning this oil, but he does not make any claim for their construction. His claim is for the mode described of obtaining and treating oil from resin.

Luther Young, of 8, Bow-lane, Cheapside, and Edwin Martin, of 19, Louisa-street, Stepney, for "*Improvements in apparatus for regulating the pressure and supply of gas.*" Patent dated Jan. 31, 1854.

This invention consists of a combination of mechanical parts into an apparatus to regulate the pressure and supply of gas. For this purpose a valve is suspended to the shorter end of a lever, such valve being caused more or less to close or open the passage by which the gas is supplied. The other, or longer, end of the lever is connected by a rod with an inverted vessel which dips into water or other fluid; and such vessel is made to float, by means of one or more floats, in a tube or tubes containing quicksilver or other fluids; and the exact pressure is obtained by weights applied to the inverted vessel. The gas coming to the apparatus, subject to more or less excess of pressure, raises the inverted vessel to such an extent as to close the valve to the degree which will admit of the quantity of gas required for the

consumption passing at the pressure desired. Where the several burners are at different elevations, or require different degrees of pressure of gas, partitions with different sizes of orifices are applied to the burners, so that only the desired quantity of gas will pass at the particular pressure to the burners.

WILLIAM MALAM, of Blackfriars-road, gas engineer, for "*Improvements in apparatus for the manufacture and holding of gas.*" Patent dated Jan. 31, 1854.

Mr. Malam's invention consists—First, in constructing gas retorts with one or two, or more, ribs or ridges, rising from the bottom of the inside thereof to about three inches, more or less, from the surface; secondly, in constructing gas condensers of a zig-zag, serpentine, or other than a straight form, in order to obtain a greater extent of surface in a given space than heretofore; thirdly, in constructing apparatus for washing gas in such manner that the gas is caused to pass down into the liquid through a series of vertical pipes, and to ascend through a layer of wire gauze or finely perforated plate, and, by means of partitions in the washing vessel, is further caused to pass through as many sets or series as may be necessary; and, fourthly, in constructing gasholders by sinking to any required depth in the ground, two concentric cylinders or circles, the space between which is filled with liquid, and combining therewith a gasometer of the ordinary construction (except that the roof is supported by girders placed outside instead of inside the top), and weighted with balance weights as usual, if necessary—the gasometer rising and falling in the space between the two cylinders sunk in the ground, according to the quantity of gas contained in it.

These improvements the patentee also combines in one arrangement—the gasholder being supported on four columns, and the retorts, furnace, condenser, and washing apparatus, placed underneath the holder. The several parts are connected together by the necessary pipe connections for conducting the gas from one to the other of them. This arrangement, the patentee says, may also be adopted for the construction of portable apparatus, the whole being mounted on wheels to admit of being removed from place to place as required.

The patentee claims—

1. The construction of gas retorts with one, two, or more ribs or ridges, rising from the inside of the bottom or floor.
2. The construction of gas condensers of a zig-zag, serpentine, or other than straight form, in order to obtain a greater extent of surface in a given space.
3. The construction of gas-washing apparatus with internal tubes and horizontal partition of wire gauze or perforated metal plate.
4. The construction of gasholders by the employment of a tank, composed of two concentric circles sunk in or built on or raised above the ground, combined with a gasometer, the roof of which is supported by external stays, such gasometer rising and falling in the space between the two concentric circles.
1. The combination of the aforesaid improvements in one arrangement, either stationary or portable.

WILLIAM LITTLE, of the Strand, for "*Improvements in distilling or obtaining products from coals and bituminous substances.*" Patent dated Feb. 4, 1854.

The object of this invention is to distil or obtain products from coals and bituminous substances, by burning in contact therewith highly heated gases, resulting from the passage and decomposition of air through fire, these highly heated gases to be used either alone or combined with steam. For this purpose the coals or bituminous substances to be distilled are placed in a chamber or vessel which is connected to a fireplace by a flue or passage, and it is also connected with a suitable condensing apparatus by a pipe or passage. Air is decomposed by passing through a red fire, and the products, alone or combined with steam, pass into the vessel or chamber containing the bituminous substances to be distilled by which means their volatile constituents are expelled and pass into the condensing apparatus. The patentee prefers to accomplish the passage of the distilling agent —*i. e.*, the decomposed air and steam—by the aid of exhausting apparatus, though other means may be resorted to.

The inventor claims the combination of apparatus described in his specification for obtaining products from coal and other bituminous substances.

JAMES YOUNG, of Glasgow, merchant, for "*Improvements in gas-making.*" Patent dated Feb. 10, 1854.

In making illuminating gas from coal, as commonly practised, the process is intermittent, in consequence of the charging and discharging of the retorts; and, besides, a notable part of the volatile matter of the coal is deposited, such as tar and other liquid compounds. These condensed products are known to consist mainly of the same elements as the illuminating gas itself; and, in as far as they are less valuable than the volume of gas, their formation in the process of gas-making is known as not desirable. The patentee's invention has for its object to render the process more economical by making the working nearly continuous, and by preventing waste, from the gas producing constituents of the coal in the formation of tar, &c.; and it consists essentially in so conducting the distillation of the coal as to convert nearly the entire available hydro-carbon products gradually and continuously into permanent gas. To accomplish this, the patentee sets the retorts vertically in the oven, with their lower ends nearly on a level with the furnace-bars; and he causes the coal with which they are charged to descend slowly and continuously from the upper to the lower end of each retort, and be there discharged regularly in the state of coke. He also places the passage for the exit of the gas at or near the lower end of the retort, in order that the hydro-carbon vapours formed in the upper parts of the retort may be exposed, in passing to the outlet, to the higher temperature of the lower parts, containing the nearly exhausted coal, and be thereby converted into permanent gas before they finally pass off from the retort in which they are generated.

In the apparatus employed by the patentee, fire-clay retorts are used by preference, made wider at their lower ends, and placed, two-and-two, on the opposite sides of the furnace, so that each pair occupies a separate chamber in the brickwork casing which surrounds the whole set. The flame and gases from the furnace pass into the retort chambers through side openings, and thence return downwards over the partition walls, whence they escape into a flue. The brickwork casing and retorts are supported on two cast-iron cisterns, each containing two separate and air-tight chambers for receiving hot coke discharged from the retorts placed immediately over them. For the purpose of keeping the temperature of these chambers as low as practicable, and cooling the coke before it is withdrawn, the cisterns in which they are formed are kept filled with water to a certain level. The retorts are surmounted by close hoppers, capable of containing each about 10 or 12 cwt. of coal, broken into small pieces in the usual manner. They are formed of sheet iron, and suitably fixed, gas-tight, by bolts to snugs made on the retorts, and provided with a luted door for the admission of the coal. In the upper apex of each copper is fixed a cast-iron bush, for the support of a stirring-bar, which bar is armed throughout its length with iron spikes, all radially on it, except at its lower end, which is bent spirally, and sweeps the surface of a disc or table fixed under the retort for the purpose of supporting the coal therein. Those radial spikes serve to agitate the contents of the retort (when put in motion by a system of gearing contrived by the patentee), and at the same time throws a portion of the coke over the edge of the table into a chamber, and there permits the gradual descent of the contents of the retort. The patentee's system of gearing, for giving motion to the stirrers, consists of a worm-wheel fixed on the top of each, and so sized that each two adjacent wheels of the set gear, pair and pair, with right and left handed worms keyed on a shaft. This shaft is carried on bearings supported by columns resting on the brickwork, and is driving at such a rate of speed in relation to the wheels as to cause the stirrers to make a turn every 12 or 15 minutes. This rate of speed also determines mainly the rate of discharge of the coke from the bottom of the retort; but the quantity discharged in a revolution of the stirrer is to some extent regulated by the distance of the table below the end of the retort. The greater this distance, within limit, the greater is the quantity thrown off in a revolution of the discharging arm. For the purpose of obtaining the power of making this adjustment, the table is supported by a screwed rod, which passes through, and is maintained by, a nut in the bottom of the water cistern, and, projecting upwards, fits into a hollow boss on the under side of the table, which boss descends through the bottom of the coke chamber into the water space without, and allows the water to ascend within it to keep its temperature as low as practicable, but is rendered water-tight, or nearly so, outside, so that no water is admitted into the coke chamber. By means of this arrangement the table can be elevated and depressed at pleasure, by turning the supporting-rod in its nut; and the rate of discharge of the coke is thereby regulated to any degree of exactness. For the purpose of distributing the coke evenly in the chambers, when becoming nearly full, the extremities of the discharging-arms are made to project downwards obliquely over the edges of the table, and rake it off at any point where it happens to accumulate unduly. When the coke chambers are filled to the height of the discharging tables, they are emptied of their contents by doors which are fitted tight, and luted in the usual manner. As the gas is formed in the retorts it passes into the coke chambers, and thence from the recesses into branch pipes leading to the hydraulic main.

This method of removing the coke from the retorts as it is formed, and discharging it into air tight chambers, is generally applicable, and the best (the patentee says) that can be used when the coke is valuable, and it is desirable to keep it dry; but when the coke is of small value it may be discharged by an endless band, formed of articulated iron bars, carried by drums or rollers on a water cistern placed under and luting the retorts; or it may be discharged upon a plate in the water cistern, and raked off regularly, either by hand or self-acting mechanism. Provision is made, when the retorts are thus luted, by taking off the gas above the level of the water in the cistern.

The patentee claims the arrangement for causing the coal in each retort to descend and be exhausted, and discharged gradually and continuously in such a way as to keep up a nearly uniform rate of production of gas in the retort, and causing the products of the distillation to pass downwards within the retort, through the hot coke therein, for the purpose of converting the hydro-carbon vapours given off in the higher part of the retort to the condition or state of permanent gas before finally escaping therefrom.

JOHN CHISOLM, Holloway, chemist, for "*Improvements in the purification of gas.*" Patent dated Feb. 20, 1854.

This invention consists in mixing together the peculiar red earthy or ochry substance found mingled with peat and the subsoil of peat with hydrate of lime, or the mixed hydrates of lime, and magnesia obtained from magnesian limestone. This combination or mixture is introduced into a dry gas purifier; and into this purifier, and through this mixture, the foul gas is then passed until it is rendered pure—such purity being ascertained by the application of the ordinary tests. The red earthy or ochry substance referred to is composed chiefly of the oxides and salts of iron and manganese; and it is principally to these metallic matters that the purifying agency of the compound is due. Consequently, the greater the quantity of these oxides the earthy matter contains, the better it is adapted for purifying purposes; and, though the exact proportion of lime to be added is not material, yet the greater the amount of metallic matters in this earthy substance, the more lime, or lime and magnesia, must be used. The proportion which the patentee prefers to use is, one part of lime by weight for every three parts by weight of metallic matters contained in the ochry substance.

Instead of this red earthy matter, the patentee sometimes employs in the same way and proportion the fine red sandy gravel so general around London, in the neighbourhood of the chalk beds; or the red

clay common in the neighbourhood of Rugby and other places; or the phosphate or subphosphate of iron, common in many boggy districts. All these, or any of them, he uses precisely in the way above described with respect to the red earthy peat matter.

When these mixtures have ceased to purify the gas from sulphuretted hydrogen and other impurities, their powers may be, in part or altogether, renewed by forcing through them a current of air, or even by merely exposing them to the air; after which they may be used with effect, several times in succession.

The inventor claims—

1. The use of the silicious earthy matter containing oxides of iron and oxides of manganese, and formed under bogs and in alluvial deposits, and treated in the manner described, for the purification of gas.
2. The use of ferruginous gravel, which overlies and is intermingled with chalk formations, treated as described, for the purification of gas.
3. The use of the ferruginous clay or loam of the alluvial formation, treated as described, for the purification of gas.
4. The use of the phosphate and subphosphate of iron which exists in the tertiary formation, treated as described, for the purification of gas.

John Gedge, 4, Wellington-street South, Strand, patent agent, for "*Improvements in the construction or adaptation of certain fittings for gas.*" (A communication.) Patent dated Feb. 21, 1854.

In order to obtain a great body of light for illuminating gas, at a cheaper rate than the present mode permits, the patentee employs a metal circle or ring, of such size as the body of light required will render necessary. This circle is attached or brazed on to the gas pendant, and is furnished with numerous small branches, each having a fishtail burner on its end. This, being covered with any suitable glass, will be forced to give an equal and steady light. The circle may be made at any enlargement from the pendant (its centre), and joined thereto by branches in the ordinary metallic circles to centres; and on the upper edge of such circle, as many fishtail burners (or their nipples only) may be affixed as are necessary for obtaining the amount or body of light required. The fishtail burners can be burnt with a regular flame, and set to any height of flame. The burners now used to obtain a great body of light are (the patentee says) mostly enlarged argand burners, or rings with gas jets from holes perforated therein. The former are irregular—the flame increasing or decreasing with the pressure of gas; and this mode is, moreover, expensive in use. The latter is wholly inefficient for the purpose of obtaining a "great central" light.

The second part of the invention relates to an improvement in the means of holding the water used where gas-fittings are made to slide up and down, as in the case of chandeliers. By the present arrangement, evaporation goes on rapidly, and the cup, or water receiver, soon becomes dry. To obviate this, the patentee uses a glass funnel, in which a suspending-rod works, which closes the cup and renders it air-tight, converting it into a species of fountain, from whence the funnel or tube receives a supply of water, and the evaporation, being confined thereto, will be almost insensible; and the apparatus will act for several years without requiring a fresh supply of water, thus avoiding any danger of escape or explosion.

The patentee claims—

1. The combination of metallic rings or circles, armed or furnished with fishtail burners or nipples.
2. The funnel, or dip-tube, for lessening evaporation.

James de Wolfe Spurr, of Kenyon-terrace, Birkenhead, for "*Improvements in distilling coals and bituminous and resinous substances, and products thereof.*" Patent dated Feb. 22, 1854.

This invention relates to the distillation of coals and bituminous and resinous substances, and the products thereof, where the distillation is carried on at low temperatures, compared with the high temperatures resorted to when distilling such substances to obtain gas—the patentee's object being to obtain the condensible liquid products, and not gas. The invention consists in carrying on such distillation by the aid of a vacuum obtained in the apparatus by means of pumps, &c.; and, in those cases where the coal or other substance is not of so fusible a nature to admit of its being readily distilled over at the desired temperature, a quantity of oil or tarry matter is added, in order to liquefy the substance, and to cause the heat more freely to penetrate the mass.

The apparatus employed by the patentee consists of a strong cast-iron retort, of a spherical shape, set in brick-work over a fire. This retort is provided with a manhole near the upper part, for the purpose of introducing the charge of materials, and for removing the residue. The retort has also a pipe connected with its upper part, leading to a worm or refrigerator of wrought iron kept cool by water. The end of the refrigerator communicates with a close receiver, which, at its lower part, has a cock or valve for drawing off the condensed products. The upper part of the receiver has a pipe communicating with an air-pump or other suitable apparatus for obtaining and maintaining a vacuum in the whole of the apparatus. The charge of bituminous coal, or resinous or tarry products, is introduced into the retort, so as to charge it to about one-third of its capacity; and, in cases where the bituminous coal or matter is not fusibe at a dull or very low red heat, oily or tarry matter, to the extent of one-third or one-fourth of the mass, is added in a broken state. The manhole being then closed, heat is to be applied gradually, till the low or very dull red heat is attained at the lower part of the retort, it being desirable to keep the heat to as low a degree as possible, in order to avoid producing incondensible gas. As good a vacuum as may be is maintained in the apparatus during the time that heat is applied. The charge having been distilled over, the heat is withdrawn, and the apparatus allowed to cool. The atmosphere is to be admitted. The fluid product is to be drawn off from the receiver, and the residue is to be removed from the vessel or retort. A fresh charge is to be introduced, and the working carried on again as explained. The product is to be purified, as like products have heretofore been purified when distilled, subject to the pressure of the atmosphere.

The inventor claims, as novel and original, the mode described of distilling bituminous coal, and bituminous and resinous substances and products thereof, *in vacuo*.

John Thomas Way, of Holles-street, Cavendish-square, Middlesex, and John Mainwaring Paine, Farnham, Surrey, for "*An improvement in the manufacture of gas, and also of charred products.*" Patent dated Feb. 28, 1854.

This invention consists of distilling a compound matter, of stone or earth (largely composed of soluble silica, and found in Surrey and other places), and tar, or fat or oil, or other organic matter, and thereby obtaining gas for the purpose of light and heat; and a charred product suitable for making filters, and for decolorising and deodorising purposes.

By "soluble silica" is meant that peculiar form or condition of silica which is found to be readily soluble in solutions of caustic potash or soda, when boiled with those solutions in open vessels. This kind of silica is, when artificially prepared, obtained by adding to solutions of silicate of potash or soda a mineral or other acid, by which the silica is precipitated in the gelatinous state. This soluble or gelatinous silica differs from the silex of sand, flint, or quartz rock, inasmuch as these last-named substances are not practically soluble in solutions of potash or soda, when boiled with those solutions in open vessels, and can only be dissolved by them when enclosed in vessels fitted with steam-tight covers, by which pressure and a much higher temperature are obtained. At the base of the chalk-hills in Surrey there is a stone or clay which contains silica in the soluble state in large quantities, in some cases amounting to as much as 74 per cent. of the freestone or clay. These minerals are easily recognised by reducing them to a fine powder, boiling the powder in caustic soda, and afterwards adding to the solution formed an excess of hydrochloric acid, which precipitates the silica.

The first part of the patentee's process consists in impregnating the earths or minerals mentioned with blood, tar, or any other animal, vegetable, or organic substance capable, when strongly heated, of yielding charcoal. This substance must be either liquid at ordinary temperatures, or must be capable of being rendered liquid by means of water or other solvents, or by the application of heat. For the manufacture of charcoal by this process in England, the patentees prefer the use of coal tar, as the cheapest substance that can be procured; but, under some circumstances, molasses or waste sugar, and other vegetable or animal liquids, may be employed.

When coal or tar gas is the liquid employed, the process is as follows:—Having selected the silica rock or earth before described, containing a high per centage of silica, and as light and porous as possible, it is dried by exposure to the air, or by artificial heat; it is then broken into pieces sufficiently small that they may be readily penetrated throughout by the tar. When the tar is heated, it will readily penetrate pieces of silica rock of the size of a man's fist; but when the tar is cold, and especially in cold weather, it is necessary to break the silica rock into pieces of the size of a hazel-nut, or smaller. By boiling the tar with a fragment of rock in it for a short time, a more rapid penetration is effected; or the silica rock, being reduced to a coarse powder, may be mixed in any suitable way (as, for instance, by a machine such as is used in pugging clay) with the tar into a thick paste. The silica rock absorbs from one-third to one-half of its weight of tar, and the patentees use it in this proportion when mixing it with powdered rock.

When employing the rock in fragments, it is convenient to use a wire basket or frame, which, by simple means, can be raised or lowered into the tar vessel, so that the rock, when saturated, can be drained from excess of the tar.

The second part of the process consists in exposing the silica rock, saturated with tar or other liquid, as described, to a high temperature, in order that inflammable gas may be produced, and that charcoal may be deposited in the pores of the silica rock. This part of the operation must be conducted in retorts of iron or clay, as in the manufacture of animal charcoal, or coal gas. Ordinary gas retorts answer the purpose perfectly well. The retorts are first made red hot, and the charge of silica rock saturated with tar is introduced in the same way as coal, in the ordinary method. The charge is withdrawn when it ceases to give off inflammable gases. Care should be exercised in drawing the charge of the silica charcoal, that it should be exposed to the air for as short a time as possible whilst red hot; and for this reason: it should either be cooled rapidly by means of water, or be received into an iron box with close covers, by which the access of air will be prevented.

The gas produced from tar in the way described is very pure, and requires less subsequent treatment than ordinary coal gas to make it fit for the general purposes of giving light and heat.

In the process as described, a variable proportion of tar is distilled without the production of charcoal, or incondensible gas. This proportion collects in the hydraulic main, and may be used to saturate a fresh portion of silica rock.

When any other liquid is employed, the process is essentially the same—due regard being had to the nature of that liquid. The products of the process are inflammable gases suitable for giving light and heat, and a charcoal fit for deodorising and disinfecting and decolorising purposes.

The patentees claim the use of the silica rock and earth described, for the purpose, when impregnated with tar, or other animal, vegetable, or organic substances, and by the aid of heat, of producing an inflammable gas, and a charcoal valuable for many purposes.

William Calibran and Joseph Calibran, of Manchester, machinists, for "*Certain improvements in apparatus for regulating or governing the supply or pressure of gas, as it is conducted from the main to the burners.*" Patent dated March 1, 1854.

This invention consists in the novel construction and arrangement

of apparatus for obtaining an even amount of gas whilst passing from the main to the burners for consumption, and, consequently, an equality of light, whatever may be the variation of the pressure of the gas. The regulation of the supply from the main to the burners is effected by means of a slide-valve or disc-valve (the slide-valve being preferred), formed by two corresponding surfaces placed together between the branch inlet-pipe from the main and the branch outlet-pipe to the burners—these slide-valves having suitable apertures for the passage of the gas, and being so arranged that when their apertures are opened the gas will pass freely; but as, by shifting the position of the slide-valve, the apertures may be gradually closed or opened to the full extent, so the quantity of gas allowed to pass from the main to the burners is regulated or governed. The continuous opening or closing of the gas passages in the slide-valve is effected simply by the variable pressure of the gas acting within a small inverted vessel or gasholder, or gasometer, after the gas has passed the valve, so that, as the pressure increases, the gas rising within the small gasometer will cause it to be slightly lifted, and, by any simple arrangement of connection or gearing to the slide or gas valve, it will be slightly shifted by the pressure, and, consequently, open or close the apertures or passages for the flow of the gas, and thus regulate the supply to the burners for combustion. The peculiar construction of such valves for regulating and equalising the pressure of gas in its passage from the main to the burners enables it to be operated upon from the incoming current of gas, by an equal amount of pressure over the whole of the valve surface presented, whereby perfect steadiness and certainty of action is secured.

The patentees claim—

1. The peculiar construction, employment, and use of an apparatus for regulating or governing the supply or pressure of gas, as it is conducted from the main to the burners, having a central slide-valve, through which the gas radiates, and thereby causes an equal pressure on all parts of the slide-valve and gasholder, and also produces the required perpendicular lift of the same, such valve being placed in the regulated gas, in contradistinction to the valves of all other known gas regulators, the valves of which have invariably been placed in the current of the irregulated gas, by which means the patentees obtain a valve which offers no resistance either to the action of the regulating surfaces or to the gasholder.

2. The peculiar construction or arrangement of an apparatus for governing or regulating the passage of gas, in which the necessary regulation of the gas, and the supply of the same to the burners for distribution, is effected in one chamber, which causes its operation to be more sensitive to the variations of pressure in the main, or to the shutting off of the supply of gas at the burners.

Legal Intelligence.

THAMES POLICE COURT.—Sept. 2, 1854.

RATING OF THE COMMERCIAL GAS WORKS.

A summons having been taken out by Mr. Southwell, the vestry clerk of the hamlet of Mile-end Old-town, which forms a large portion of the extensive parish of Stepney, against Mr. George Jacques, the secretary of the Commercial Gas Company, calling upon him to pay two rates, amounting to £326. 13s. 4d.; and, Saturday having been appointed for the hearing of the case, the overseers, vestry clerk, and a number of the inhabitants, attended. The defendant, or rather the Gas Company, was represented by Mr. Marten, of the firm of Marten, Thomas, and Hollams, solicitors.

Mr. Ingham supposed the object of both parties was to save the expense of appeal, and, if they could come to an arrangement to refer the matter to arbitration, it would be much better, and more satisfactory than taking the case to the court of quarter sessions, and stating a case for the Court of Queen's Bench. He asked if any law points were likely to arise?

Mr. Hammack: Not at all; it is a mere question of figures.

Mr. Southwell had no objection to arbitration, if the matter was not further delayed.

After a long discussion, in which all parties seemed disposed to agree to arbitration,

Mr. Jenkins, an overseer, said, it was the duty of himself and colleagues to collect the rates, and the gas company had been treated with too much indulgence. There were two rates due, and a third to be made at the end of the month. The overseers had no vindictive motives to gratify. A surveyor was appointed by the board of guardians, who made his return, and said the rateable value was £4900. By that return he was prepared to stand. It might seem strange to increase the assessment from £1300 to £4900, but it must be recollected very extensive additions had been made to the works and mains of the Commercial Gas Company, and £7000 had been lately expended in new offices and buildings. The property in the vicinity of the gas works was much depreciated, and everything near it was blackened by such a manufactory. The health and comfort of the people of Stepney were affected by such large gas works and gasometers in such a populous district.

Mr. Ingham thought there ought to be no more delays, and that the overseers had acted very fairly in submitting to an arbitration.

Mr. Jenkins: Why do not the gas company appeal?

Mr. Marten: We wish to save the expense, and not involve the hamlet in litigation?

Mr. Ingham: If a rate is produced here, and proof of demand given, I have no alternative but to enforce its payment.

Mr. Marten: I am perfectly aware you must do that, and that you cannot go into the validity of the rate.

Mr. Ingham then suggested the propriety of the case being allowed to stand over, to give the parties an opportunity of coming to some binding agreement; and eventually, on the proposal of Mr. Jenkins, the hearing of the summons was adjourned for a fortnight.

ALLEGED GAS-STEALING BY TAMPERING WITH METERS.

IMPORTANT PROCEEDINGS BEFORE THE MARYLEBONE POLICE COURT.

At the Marylebone Police Court, on Thursday, the 31st ult., three summonses were appointed for hearing, taken out, at the instance of the Imperial Gas Light and Coke Company, against *Thomas* and *Henry Tibbey*, pie-shop-keepers, and a female named *Ann Jenkins*, the mother-in-law of Henry Tibbey, all of whom are alleged to be concerned in a systematic mode of defrauding the Imperial and other gas companies, in which their various premises are situate, of gas to a considerable amount.

Mr. Hardwicke was the sitting magistrate, and the proceedings excited considerable interest, there being representatives of the Imperial, the Phœnix, and other companies, present. The Imperial Gas Company were represented by Mr. Cox, of the firm of Cox and Willoughby, their solicitors; Mr. Herring, solicitor, appeared for the Tibbeys; and Mr. Wilding, from the office of Mr. Cooper, solicitor, of New Church-street, for the defendant, Ann Jenkins.

The hearing of the case was appointed for two o'clock, and when it was called on,

Mr. Cox said, he should proceed first with the case of Thomas Tibbey.

Mr. Herring said he was not ready in the case of Thomas Tibbey, but he was in the case of Henry Tibbey.

Mr. Cox: There are important reasons why the case of Thomas Tibbey should be heard first, and, if Mr. Herring was not ready in that case, he had no objection to wait till he was.

Mr. Herring said the cases were quite distinct, and therefore, as he was not yet fully instructed in Thomas Tibbey's case, he saw no reason why they should not proceed with Henry Tibbey's case. The fact was that Henry Tibbey, who lived in the City, was summoned for an offence alleged to have taken place in Marylebone.

Mr. Hardwicke: Unless there is something very striking, or connecting the two cases, I think you had better proceed with the one you have ready.

Mr. Cox: Thomas Tibbey, your worship, is here in court, and if Henry Tibbey's case is heard first, then he will go away, although I may want to call him as a witness in the other case. Under these circumstances, I hope the court will not force me on with Henry Tibbey's case. If my friend Mr. Herring will undertake that Henry Tibbey shall not depart if his case is taken first, but remains to be summoned as a witness in the other case, then I am content to proceed.

Mr. Herring: I will be candid. I will not be answerable for what my client may do when his case is decided.

Mr. Cox: Then let him be summoned now.

Mr. Herring: I submit to the bench that my client is summoned here as a defendant, and not to give evidence.

Mr. Hardwicke: I think, Mr. Cox, you had better proceed with the case.

Mr. Cox: Very well.

At the suggestion of Mr. Herring, all witnesses were ordered out of court.

Mr. Cox then said that this case was brought, upon a summons against Henry Tibbey, under two sections of the acts of Parliament which governed the Imperial Gas Company, relating to the offence, that being in the possession of a certain house, which he had occupied under the other defendant, Ann Jenkins, in conjunction with her, had knowingly and fraudulently consumed large quantities of gas, the property of the said Imperial Gas Company, which she and he had not paid for. Ann Jenkins entered into her contract with the company in 1852, to supply her with gas, to be burned by meter.

Mr. Wilding objected to the mixing up of his client's name with this case.

Mr. Cox said it was necessary to do so, to show the connection between the parties. In the first instance they had what was called a dry meter; but subsequently, at their request, another, and a wet meter, was supplied. He here produced the meter before the court, and explained that in the small box in which the lever is placed, which is forced up by the water as the passage of the gas progresses through it, so as to register the amount consumed, a hole had been made, which had the effect of enabling the parties to consume a large quantity of gas without passing through the register at all. He further said that scheme was conducted on a scientific principle, and no doubt the first culprit was the party who had put the Tibbeys up to this plan of using gas without paying for it. The same plan would not act upon a dry meter. When a hole was made in the box of the meter, as he had described to the worthy magistrate, all the gas which passed through such hole was not indicated by the indicator at all. The fact was that this hole ought not to be there; but the whole affair had been so carefully done that the parties had even gone to the expense of an inside lining. Ann Jenkins, who was the mother of the wife of Henry Tibbey, contracted with the company for her supply of gas in 1852, but subsequently the premises were transferred, they believed, to Henry Tibbey, whose wife managed the business, namely, that of a penny pie-shop, and had been in posseesion from March 26 last, and it was for that period they had taken out the summons. All the gas that the Tibbeys had paid for from that period was 9000 feet, which, taking into consideration the number of lights they burned, and the length of time they had burned them, was 25,000 feet less gas than ought to be paid for. The Tibbeys had several shops, and it could be proved that the same tampering with the meter which had been carried on there in Marylebone, had been carried on in other places. He (Mr. Cox) should show beyond all doubt that Tibbey was carrying on his business for his own benefit, and paying his mother the necessary rent for the premises during the periods mentioned in the summons. They had had other meters taken down which Tibbey had had put up, and they had found the same defects in them which he had exhibited in this instance to the court. This meter produced was put up at Tibbey's house in Mrs. Jenkins's time; and, although he did not know the defence which was

to be set up, his learned friend might contend, if he liked, that Mrs. Jenkins did this; at all events he would distinctly prove that it was not in that condition when it was put up. He would call the man who made the meter; he would call the Imperial Company's inspector, who tested the meter at the time it was put up; so that if his learned friend chose to convict Mrs. Jenkins, or she to convict herself, why, let them do so. He should prove, by the most conclusive evidence, that from the number of lights burned from that meter, from the time mentioned in the summons, Tibbey did not pay for one-fourth of the gas which that meter ought to have indicated, and would have indi- if it had not been tampered with.

Mr. HARDWICKE: Will you be able to prove that he was cognisant of all that you have stated has been done?

Mr. COX: It will be for the court to judge whether he could be ignorant of it, after it has heard my evidence. I can prove the tampering by this man with other meters in the same way.

Mr. HERRING: I object to that observation. You have no right to state anything which may have taken place elsewhere, to prejudice the case.

Mr. COX: I think I have quite a right to state that the same party was summoned the week before last for a similar offence, and pleaded guilty, at another place.

Mr. HERRING: I protest against this attempt to prejudice the case, and to allow such a statement to go forth to the public press, to the injury of my client.

Mr. COX: I shall prove that the proceedings are systematic; and I shall connect Thomas Tibbey, Henry Tibbey, and Mrs. Jenkins, in the transaction.

Mr. HARDWICKE: The most important point would be to find out who the party is who instigated and discovered this method of stealing the gas.

Mr. COX: Undoubtedly the individual who put these parties up to this means of defrauding gas companies is the great delinquent, and he ought to be the party charged here before this court if we could find him. I should like to have the opportunity of bringing to justice the man whose scientific knowledge has put these parties up to this. It is a great and monstrous wrong, and we should be glad to find it out; but, in the absence of that party, we can only proceed against those we believe to have committed and been parties to the fraud.

Mr. HERRING: I understand that my learned friend intends to go for penalties under two sections of the act of Parliament governing the Imperial Gas Company.

Mr. COX: Yes; and I propose to take the evidence in two cases under those clauses before this court.

Mr. HERRING: Then I have two objections to take to the wording of this summons. It is served on Henry Tibbey, of Newgate-street, in the City of London; and he is summoned for certain acts done in the parish of Marylebone, from March 26, at a house which, I am instructed to say, he never occupied. And my second objection is, that the house referred to in the parish of Marylebone is not specified. This summons is served upon my client in Newgate-street, for an offence alleged to have taken place in Marylebone, where we have no premises. I contend that not only ought my learned friend to have set out the offence of which my client is charged, but that he is bound to specify the house and the name of the street at which such alleged offence was committed, neither of which is done in the summons which has been served on my client. Our premises are in Newgate-street, in the City of London, and we have nothing to do with the parish of Marylebone. For these reasons I submit that the summons must be dismissed by this court as informal.

Mr. COX: I submit to the court that to take out a summons for an offence within the jurisdiction of the court, is quite sufficient, without specifying either the house or the name of the street, when the offence would be proved before the court, and the name of the street and number of the house given on oath. If your worship rules to the contrary, I have no objection, as I have no desire to take this man by surprise.

Mr. HARDWICKE: It may happen that a man may have premises in half a dozen different places, and I think he ought to know at which he is charged with having improperly abstracted the gas.

Mr. COX: I submit that the summons is right, and that there is no necessity, in a mere summons, to go into all the charges against a party chapter and verse.

Mr. HERRING: And, on the contrary, I contend that not only has my learned friend a right to set out the charge in the summons, but also that the name of the street and the house where the offence is committed should be stated. In a case of assault, the time and place must be stated; and my learned friend must have done so in this case, if he had indicted my client for a criminal offence, which I contend, if he has a case, he ought to have done; for stealing this gas, if it be proved, is a criminal offence.

Mr. COX: I am taking the milder course.

Mr. HERRING: I don't know whether you are going to indict these men after these cases have been heard or not. I adhere to my objections.

Mr. COX: I submit, your worship, that these objections are too late after I have opened my case. I do say that I have a *locus standi* upon this summons, and I ought to be permitted to proceed.

Mr. HARDWICKE: I must say that I do think the Imperial Company ought to have given the parties a more explicit knowledge of the charge to be preferred against them. I think the house ought to be named, where the alleged offence has been committed.

Mr. COX: What course, then, do you propose to take?

Mr. HARDWICKE: Dismiss the present summons. You can have new summonses, if you think proper.

Mr. COX: Very well; then I will apply for fresh summonses now.

Mr. HARDWICKE: Very well; you can have them.

Mr. HERRING: I think, your worship, this is a case for costs. Here is the Imperial Gas Company—a powerful and wealthy company—having the most able advocates; and they make this mistake, and drag my clients here from their business. I do think your worship will agree with me, that they ought to have their costs.

M. HARDWICKE: I can say nothing about costs just now.

The summons was then dismissed, and new summonses were applied for.

Miscellaneous News.

WARNER'S PATENT DRY GAS-METER.

Mr. Henry Johns, in his evening lecture on the mechanical novelties of the day, at the Polytechnic Institution, on Monday evening, Aug. 9, referred to Mr. Warner's improvements in the construction of dry gas-meters, and explained, in a popular manner, the contrivances by which the patentee remedies the defects of the meters at present in use. There were many reasons, the lecturer said, why the dry meter should be preferred to the wet, and the most cogent appeared to be this—that gas passing through any fluid would take up part of that fluid, and thus give rise to what their juvenile friends not inaptly turned "the bobbing of the lights." There were several drawbacks, however, to the present construction of the dry meter. In the first place, the gas passed to the consumer by means of a double arrangement of valves, well known to engineers by the name of "D-slide valves," and the point of application of the power to the valve was outside, and high above the base of the cover, so that, when any accumulation from gas took place up on the face of the valve, an obstruction was occasioned, and as the valve, in consequence of the resistance offered by such obstruction, did not proceed upon its base, the power was applied in a place diametrically opposite to that in which its effect ought to be experienced. The consequence was—as engineers expressed it—the valves "kicked." Now, in order to overcome this defect, Mr. Warner had adopted a very different arrangement for moving the valve. Instead of removing it by placing the power so much above the base of the valve, he applied the power *at* the base, and by two pendulous arms produced an oscillating motion, which moved the valve from its centre of gravity, so that when any accumulation took place on the face, instead of permitting the gas to pass through unregistered, these valves, to a certain extent, removed the obstruction, or, if the obstruction were irremoveable—supposing, for instance, that it was occasioned by some glutinous matter which would oppose the motion of the valve—then the apparatus would be brought to a stand-still, until the obstructive deposit was removed. The valve, according to Mr. Warner's invention, was also constructed in a very different manner to those at present used. In the ordinary method, the valve seat and face were composed of one piece, and had to be soldered down, so that, in the heat of this operation, there was a contraction or expansion of the metal, and, however true the seat might be previous to the soldering, it was then found to be perfectly unsound. The faces had consequently to be reworked, and ground to one another. Now, any of the filings which might fall down through the openings during this operation, would be again blown up into the valve on the exertion of any amount of pressure, and thus form an obstruction. The manner in which Mr. Warner had overcome the difficulty of this expansion—which led to what was technically called a "buckling" of the face of the valve—was by making the face of the valve in a separate piece, grinding it properly to the surface of the cover, and then by means of two simple screws—one at each end—he fixed the face to its seat, and made the joint sound by means of a cement, so that there was no fear of its being affected by the temperature. Again, another very great improvement introduced by Mr. Warner was the protection of the delicate parts of the meter from the corrosive action of the gas. In the old meter, the parts which were injured in this manner were the rod communicating motion to the valve, the guide, and the guide wires. Many efforts had been made to protect these, the most delicate parts of the apparratus, but, until Mr. Warner's improvement, none had been crowned with success. Mr. Warner allowed the gas only to act on those parts which it was essential it should act upon—that was to say, the valve, the valve seat, and the part which communicated motion to the valve; and it might be seen, from the peculiar arrangement of the meter, that there was not much danger of its falling out of repair, because if there were any accumulation, after one or two movements a blow of the valve would cause the deposit to fall through, and there was plenty of room to receive it. Another very great improvement devised by Mr. Warner related to another part of the meter which was also liable to sustain great injury—namely, the elastic material by which the moveable diaphragms were fixed to the frame of the meter. The general way of constructing the diaphragm, and its moveable part, was to have a certain amount of elastic material—usually leather—and then, when the contraction took place, it was doubled up until the diaphragm came close to the point at which its flexible portion was connected with the meter. By an ingenious contrivance, Mr. Warner had got rid of half the difficulty, because, by reducing half the material, there was only half the risk. The old method was to move the flexible material nearly back to the point of its attachments. Mr. Warner moved it just as much one side of the point of attachment as on the other, thus obtaining the same measurement with only half the material. The old method was just like a door which opened only in one direction; while Mr. Warner's improvement resembled a door which was capable of revolving in either direction—moveable just as much on one side of the hinges as the other. Thus, Mr. Warner reduced not only the friction and resistance, but the liability of this flexible material to sustain injury. Another part of Mr. Warner's invention which was well worthy of notice, was the peculiarity in the construction of the "tangent screw" of the meter, or, as Mr. Warner much better designated it, the "regulating crank," for certainly, why it ever was given the name of a "tangent screw" could not be discovered, as it had not the remotest resemblance to a tangent. It was

this portion of the apparatus which received the motion from the pressure of the gas. By means of a rod carried along the base, motion was communicated to the valves which controlled the entrance and exit of the gas into the diaphragm. In hot climates—France and Spain for instance—great errors were occasioned in the registration of gas, by the expansion of the material of which this tangent screw was made. To remedy this, Mr. Warner had contrived a screw formed of two different metals—the upper part, say, being of iron, and the lower part of brass; but it mattered not what two metals were employed, so long as they expanded in equal ratio. Now, if the iron portion, by an excess of temperature, expanded in one direction, the lower brass portion would expand just as much in the other direction; and thus the point of application of power was always maintained in one place, because, whatever was the amount of expansion which might take place in the upper part, it would be counterbalanced by a corresponding expansion in the lower part. This, as Mr. Warner justly admitted, was merely an adaptation of the principle of the expansion pendulum introduced in the year 1820. Mr. H. Johns's description was assisted by models of the patentee's apparatus, by which he illustrated to the audience the process of measurement, and the distinctive features of Mr. Warner's invention.

Mr. Johns concluded by observing that the patent right had been purchased by Mr. Thomas Edge, of Westminster, the well-known meter-maker, which would be a sufficient guarantee for their good manufacture.

HALF-YEARLY MEETING OF THE PHŒNIX GAS COMPANY.

The half-yearly meeting was held at the Bridge-house Hotel, Southwark, on Wednesday, the 16th ult.—John Edward Johnson, Esq., in the chair—for the purpose of declaring a dividend up to midsummer last. The notice further stated that the meeting would be made special for the purpose of raising a further sum of money, not exceeding £90,000, in the share or proportion of £10 additional upon each of the present shares, in pursuance of the powers contained in the fifth clause of the act of incorporation; and for the further purpose of making a call of £2 upon each of the present shares, payable in two instalments of £1 each.

The minutes of the last meeting were read and confirmed, after which the Secretary (Mr. Charles Pridden) read the following report:—

"Gentlemen,—The advertisement, which has just been read, having assembled you together, pursuant to the regulations of your act of incorporation, your directors submit to your consideration their proceedings during the last half-year, and the accounts, examined and certified by your auditors.

"Your directors have to report that the system of separate districts to each company continues to work satisfactorily, and that the consumers generally have paid the advanced price of gas without much objection.

"At your last meeting it was announced to you that the demand for gas had so enormously increased within the last few years that the present capital of the company was insufficient, and that it had become absolutely necessary that additional gasholders should be erected, and mains of an unusual calibre laid down, both being required as much for the efficient supply of gas to the public as for the economical and advantageous working of the concern. Contracts to complete these extensions have been entered into; a considerable sum of money has been paid on account thereof, and the remainder will be required shortly. At the last meeting of the proprietors the directors were fully authorised to raise such further capital as should be required, in such manner as they might be advised. As the act of incorporation contains no borrowing powers, your directors were prevented by legal difficulties from obtaining the funds required in that manner. Neither could they create preference shares, nor allot shares to proprietors or others at a less price than had been paid up on original shares. After much consideration and inquiry, your directors were advised, on high legal authority, that the only mode of raising further capital was that specified in the fifth clause of the act, and as stated in the notice of this day's meeting, viz., the raising additional capital among the proprietors in equal proportions upon each of the present shares. Such additional capital to be called for by the general meetings of proprietors from time to time, as required. As the completion of these extensions in the plant of the company above mentioned is of paramount importance, as well for the earning of the dividend as for the future increase of it, your directors rely with confidence on the support of the proprietors in a matter of such grave importance, and in which the future prosperity of the company is so deeply involved.

"The proprietors will observe that for the half-year ending at midsummer last, a net profit of £9773. 11s. 5d. had been realised, out of which the directors recommend that a dividend at and after the rate of £4 per cent. per annum for the half-year upon the entire capital of the company at Midsummer last (being £9000), together with the income-tax on the profits of the company (£376. 10s.), making a total of £9376. 10s., be declared, leaving an amount of £397. 1s. 5d. to be added to the balance of £9891. 5s. (left undivided after the payment of the dividend declared in February last), and which will make an amount of £10,288. 6s. 5d. undivided profit in hand.

"The directors congratulate the proprietors on the improved condition of the company's affairs, and they trust by great diligence, and the continued support of the proprietors, to extend further the prosperity of the undertaking. "J. E. Johnson."

Abstract of the Trade Account for Six Months ending Midsummer, 1854.

Debtor.				Creditor.			
Coals used		£28,561	4 0	Rental for light		£44,018	10 9
Tradesmen's bills		5,506	10 9	Coke made for sale		17,665	2 9
Retorts used		292	5 11	Breeze		1,002	7 6
„ repairs	£633 14 6			Tar		1,023	17 10
„ fixing	395 5 0			Ammonia		271	3 3
Meter depreciation	917 1 0						
		1,946	0 6				
Rent, rates, and taxes		2,054	19 0				
Directors £500, auditors £21		521	0 0				
Salaries		2,035	1 9				
Wages paid		8,957	16 3				
Interest		232	16 11				
Bad debts and overcharges		964	13 7				
Depreciation on plant and leasehold property		3,135	2 0				
Net profit		9,773	11 5				
Total		£63,981	2 1	Total		63,981	2 1
				Net profit		£9,773	11 5

Abstract of Balance Sheet for Midsummer, 1854.

Debtor.				Creditor.			
Capital of 9000 shares		£450,000	0 0	Plant, Christmas, 1853		£418,018	3 0
Unpaid dividends		386	1 6	Written off this half-year—			
Unpaid tradesmen's bills		10,534	6 3	Less for depreciation on plant and leasehold property	£3135 2 0		
Balance of Profit and Loss—				Cash received for mains sold	6051 1 0		
Undivided balance	£9891 5 0					9,186	3 0
Half-year's profit	9773 11 5					408,832	0 0
		19,664	16 5	Add—expended this half-year in extension of works		8,543	14 9
						417,375	14 9
				Due from proprietors for call		364	0 0
Income-tax will be	£ 376 10 0			Rental, midsummer quarter	£16,838 6 2		
Dividend at three per cent. and tax	7,126 10 0			Ditto, arrears	3,530 9 5		
„ three and a half	8,251 10 0			Coke	2,323 16 3		
„ four	9,376 10 0			Breeze	1,145 14 0		
„ four and a half	10,501 10 0			Tar	555 1 10		
				Ammonia	546 13 4		
				Sundries	3,218 8 7		
						28,158	9 7
				Stock of coals	£12,101 7 2		
				Breeze	14 0 0		
				Tar	136 10 0		
				Retorts	3,276 5 0		
				Meters	12,836 17 0		
						28,364	19 2
				Balance at treasurer's		6,322	0 8
Total		£480,585	4 2	Total		£480,585	4 2

A PROPRIETOR said, the report must be considered on all hands a most satisfactory one; and he begged to ask whether there was any objection to its being printed and sent to each shareholder, as it was impossible to retain the various topics embraced from the mere reading by the secretary?

The CHAIRMAN said, as the meeting had decided, and he thought very properly so, to admit the reporters, he saw no objection to the printing and circulation of the report amongst the proprietors. They had nothing to conceal, and would consider it a favour that the shareholders should give as much attention as possible to the affairs of the company.

Mr. THOMAS GIBBES (deputy-chairman) said, it now became his duty to move that the report of the directors and the statement of accounts be received and entered with the minutes. In doing so he should have to make but few observations, inasmuch as the report told them, and the circular which they had received stated, that there were some special resolutions to be moved; and, therefore, he would studiously avoid touching upon those matters, but would confine himself to what he considered the portions of the report as to the proceedings of the last half-year. He thought, in the first place, considering the position in which gas companies had been placed for the last three or four years, there was reason to congratulate them that the directors were enabled to lay before them a more satisfactory balance-sheet for the last half-year than it had been their lot to do for many years preceding. If any one supposed that the situation of a gas director was a bed of roses, he could assure them he was egregiously mistaken. There had not only been for many years past an enormous amount of opposition to contend with, but during the last twelve months there had been an increase in the price of everything which came into the manufacture of gas: coals had increased in price, freights were much higher, wages were increased, and the price of every kind of material used was considerably enhanced; and yet, notwithstanding all this, the directors were enabled to place before them a balance-sheet for the last half-year, out of which they would receive 4 per cent., instead of the 3½ per cent. which they had received for the two years preceding. This was a subject on which he might justly congratulate them. He was also happy to say that under an arrangement of separate districts, which commenced at Michaelmas last, there had been a cessation of all hostility on that side of the water; there had been no bickerings, or canvassing to get customers from each other, every one keeping to their own. The most perfect harmony had been established, which would produce results for the future of a most gratifying kind. The chief improvement on the credit side of the account was the increased amount received for the sale of coke; and from that cause principally arose their ability to pay the increased dividend which was now proposed. One other thing, however, had assisted to that result, viz., that since last Christmas the price charged to the consumers was 4s. 6d. per 1000: that, of course, had been an assistance to them; and, as the report stated, the addition to the price received very trifling opposition. He did not know that there was any other subject connected with the report that he could with propriety touch upon; and the special resolutions to be hereafter submitted would no doubt call forth some observations at the proper time. He would, therefore, satisfy himself by moving the adoption of the report and statement of accounts.

Mr. RHODES seconded the motion.

Mr. NAISH (of Bristol) said, after what has fallen from the chairman as to the wish felt by the directors that the proprietors should give as much attention as possible to the affairs of the company, he might be allowed to make one or two remarks. The word "prosperous" was used on two occasions in the present report: now, he apprehended that was intended only to be used in comparison with the last and preceding half-year's dividends, and was not to be taken as an abstract term, for he found that the Phœnix stands at the bottom of the list as regarded the profits of working. If they took the accounts of the Equitable they would find (without pledging himself to the exact accuracy of the figures) that the proportion which the divisible profit bore to the rental was 34·72; the Great Central, 24·75; the Western, 23·82; the London, 20·32; and the Phœnix, 18·55. The working expenses were also in the following proportions:—Equitable, 57·01; Great Central, 67·04; Western, 67·65; London, 67·97; Phœnix, 73·68. Consequently—although it was unpleasant to raise objections to the report of gentlemen who had done their best, and who had presented an improved state of affairs on the present occasion—he thought they could hardly apply the term "prosperous" to this concern otherwise than by way of comparison with the results of former half-years; and he had certainly felt an objection to paying calls when with each payment they had to submit to a reduction of the dividend they received. As regarded the accounts, he begged to ask one or two questions; but there was one point in particular upon which he wished to have a distinct answer, unless the directors saw reason to withhold the information—that was, as to the per centage of waste. He did not put much reliance upon rumours, which were often exaggerated, but he had been told that the Phœnix waste was immense. He wished also to ask one question upon the accounts. With regard to the balance for dividend, it was stated that the capital amounts to £450,000; add to which a loan of £10,305; equal to £460,000: then, on the other side, there was credit for plant and available stock, £445,533; leaving £14,467 of unexplained capital. He had no doubt the directors could give a satisfactory explanation of the matter, but it could not be gathered from the accounts. Before they granted any further money, they ought to know how the capital already contributed had been appropriated. Reference was made to undivided profits of about £9000, the cash received for which he supposed had been actually expended in extensions of works which the report spoke of.

Mr. WILLIAMS expressed his surprise that questions like this should be raised with an improved dividend. He thought they ought to be well satisfied with the state of their affairs.

The CHAIRMAN would answer the question of the honourable proprietor at once with regard to the waste. He was happy to say that it was considerably less last half than during the previous half year. The figures for the latter period as regarded waste were 35½, which included the whole amount of gas which was not paid for. By a careful inspection of their mains, a work which would be continued, they had reduced the waste last year to 31.

Mr. NAISH: That is quite satisfactory.

The CHAIRMAN added that he was not at that time prepared to go into the question of comparison of profits, as introduced by the honourable proprietor. Whether he was right or not in his figures, he (the chairman) could not say; but he had omitted to take into account the amount of £3136, set aside for depreciation, which would bring up their profits nearer to 30 than 18, as stated: £30,000 was the amount of the floating capital. There were debts owing to the concern for gas rental, coke, and things of that sort.

Mr. APSLEY PELLATT, M.P., said the question of waste was a very important one; but it was to be borne in mind that the alterations which had recently been made in the mains, attendant upon a separate arrangement of districts, had occasioned a greater waste of gas than would be the case for the future. If it had been the intention of the honourable proprietor to bring forward the comparison o profits of this company with others, he (Mr. Pellatt) regretted that the honourable proprietor did not apprise the directors of his intention, in order that they might have gone into those details for themselves, and thus have been prepared upon the question as to what proportion the expenses bear to the rental. Now, if the honourable proprietor had put the questions, how much coke had been sold, and how much gas had been manufactured, as compared with the quantity of coal used, that would be a fair way of putting the thing with regard to economical management. If the honourable proprietor would furnish his figures to the directors, they would be happy to go into the subject.

Mr. NAISH: There is a difficulty in making the comparison with other companies. I do not contend that the figures I have given are exactly correct, but they are an approximation, and I only put them before you in that way. But, at the same time, I think the fact cannot be disputed that the Phœnix stands below other companies in the amount of profits, and therefore, on that account, we are the more anxious to have every information before we raise any further capital.

Mr. PELLATT: With regard to the quality of the gas, I believe we stand A 1.

A PROPRIETOR asked what had been the average of waste during the last five years?

The CHAIRMAN: I cannot go into that matter beyond the period at which I joined the board. I have told you the waste for the half-year up to last Christmas was rather over thirty-five, and at that time we were making great changes. Since then the amount of waste has been reduced by more than 4½ per cent.

Mr. JOSEPH BOX said, it afforded him no small degree of satisfaction to find at the present meeting there were gentlemen intent upon looking into the affairs of the concern, and sifting into the financial condition of the company. He was glad to see it, as it was a thing which was wanting for many years past. He had frequently brought it forward, but, somehow or other, it always had the go-by—either the proprietors had no confidence in his statements, or they placed undue confidence in the then board of directors. But things were now in a better condition than they were a little while back, and the concern was certainly progressing in various points of view. He begged those who were not in the habit of attending the meetings to take it as a fact from him, that the company were progressing, and he would adduce a few figures in proof of that assertion. He found that the capital was £450,000, upon which amount dividend was now paid; but he found, also, there had been extensions made to the plant out of the profits—an amount, in the whole, of £95,835; that had been carried to the credit of the plant, and he was now speaking from figures which he had taken from the books. Now, a word or two as to the writing off. There had been written off from profits for depreciation of plant and leasehold property, the sum of £87,435, and there had been a profit upon the sale of 500 shares held by the company some years back of £6024. There had been a sale of materials, such as mains, steam-engines, and other things, the amount realised being £10,687, making a sum of £104,148 addition to the capital. Then, if he took the £95,000 taken from profits for plant and extensions from the £104,000, it left £8000 odd, which he could in no way account for, unless (and that would only be an assumption) he went to the surplus profit for it. If it was not taken from that, he did not know where it was to come from; and, if that were so, the surplus profits ought not to stand as £9891, inasmuch as the whole or the greater part had been swallowed up by extensions. This was what he had called attention to in former years, and they would find in the present report, "balance at the disposal of the meeting," so much. If that were the case, they had it to dispose of; but, as he said before, he did not know where the £9891 was, except, as he had surmised, that it had been swallowed up in additions to the plant. He could not find it out. From his position as an auditor, he had gone through the accounts more carefully, perhaps, than any other proprietor present, and he had been incited to more particular attention on the present occasion from the fact that the directors were about to apply for a further addition to the capital. He called it a second capital; and according to the terms of their act of incorporation, he did not see how it could be brought forward in any other name. His attention, during the last three or four days, had been specially directed to the financial condition of the company, with the view of acquainting his copartners fully as to the position in which they stood. As to the capital itself, the amount at present subscribed was £450,000; expended in plant, &c., £417,375; and they had stock in hand amounting to £28,364, in coals, coke, tar, retorts, and meters. That left at the disposal of the directors, £4259; and then there was the balance

of what was called unappropriated profits. It was not in plant nor in stock, so far as the books showed. Then there was an amount owing to the company for gas, coke, and various matters, £28,522. On the other hand, there was owing by the company, up to midsummer, £10,534; and unpaid dividends, £386. The difference between what was owing to the company and what was owing by the company was £17,624, leaving a balance in favour of the company, as shown by the books, of £21,834, which might be carried to the trading capital. He was willing to look at it in this way. Then there was what he was to consider the undivided profit of £9891. They had been told by the directors, at former periods, that, in point of fact, they had not that sum in cash, but that it had been employed in construction; and, if that were so, he was at a loss to consider why it should appear still in the accounts as undivided balance, for what effect had it in appearing in the accounts? Any gentleman taking up these accounts would say—"Oh, here is an undivided balance of £9000 or £10,000 which will go to make up any deficiency in the receipts." It would be considered there was that sum to fall back upon. If they had in truth that sum to fly to, it would be all very good, but it was not the case in point of fact. It had already been employed in plant or stock, or there might be a very small balance. What he wanted was, that the accounts should be such that gentlemen might not have their minds impressed with an idea more favourable than the real state of things justified. With respect to the working of the concern, he found that for the half-year ending midsummer, 1853, the quantity of coals used was 31,181 tons, giving a rental of £40,362, or 3s. 4¾d. per 1000. From midsummer to Christmas the quantity of coal was 34,079 tons, yielding £41,676, giving 3·218, or 3s. 2½d. per 1000. For the last half-year 31,876 tons of coal, yielding £44,018, giving 3·633, or 3s. 7½d. per 1000. So that there was a profit last half-year of 5d. per 1000 above that of the preceding half-year upon the many millions of feet which they manufactured, which was in itself a result of very considerable importance. Therefore, taking a comparative view of the working of the concern, it must be admitted that they were in a favourable position. But he had as yet said nothing with regard to coke; he had been looking principally to the gas returns, for what he wanted was a good rental. It had been stated that they reaped a larger profit from the sale of coke. For the half-year ending midsummer, 1851, the quantity of coke sold was £7000 odd; in the corresponding half of 1853 it was £9000 odd; but for the last half-year it was £17,000 odd. Another thing to be looked at was the saving that had been effected in the article of retorts; for whereas the cost under that head for the half-year ending midsummer, 1852, was £1548, for the last half-year it was only £292. That was owing to the introduction of clay retorts. He had great pleasure in making these statements, because he felt they were going on favourably in the right direction. There appeared to be a bright spot in the future, but he was afraid the increase of the capital would spread a cloud over that bright spot, unless the directors were determined to dispel it; and they had not yet done it to his satisfaction.

The CHAIRMAN suggested that the discussion upon the special business should be reserved till the proper time for it arrived.

A PROPRIETOR wished to know whether the increased receipts for coke arose from the larger quantity sold, or from the additional price charged?

Mr. BOX believed it arose both from the larger quantity sold and the increased price. It appeared that there was at present no coke on hand, as no stock of that commodity appeared in the accounts. The honourable proprietor added that, as regarded the accounts, he felt that they had cause to congratulate each other upon the improved state of their affairs, and he should therefore support the adoption of the report.

Mr. R. A. GRAY considered that the honourable proprietor who spoke last had jumped to a conclusion with regard to the appropriation of the £9891. As an auditor of the company, it was for the honourable proprietor to inquire into an item with respect to which he was in any doubt.

Mr. BOX: I hope I may be able to get out of every difficulty as easily as I can out of this. I take the books as they come before me. It is not for me to go back five-and-twenty years and inquire into the meaning of this or that. If my honourable friend had remarked my observation, I said, "according to the books of the company," and I abide by that. It will be recollected that gentlemen in the direction have told us on former occasions that this money has been absorbed in plant, and yet it still appears in the books in the form I have stated, and therefore I spoke correctly when I said, "according to the books."

Mr. BAILEY (another auditor) said: The only question was whether the amount should appear as it does, or whether it should be written off as plant. He considered the latter was the proper mode. It was not a divisible balance, as in reality it did not exist.

Mr. NAISH: Then £9000 odd must be added to the valuation of the plant. To talk of £9000 floating capital is a fallacy.

The CHAIRMAN: It has not gone to plant at all. You require, of course, a working capital to carry on a concern like this. Doing a business of some £63,000 in the half-year, we must have some money afloat in the trade. You find on one side we have unpaid tradesmen's bills, £10,000. If you had not the £9891 the tradesmen's bills would have been so much more. On the other side you have £28,000 owing to the company, and in coals stock £12,000. I am delighted to find that we have present persons who are acquainted with gas business, and who take the trouble to institute comparisons with other companies. We do not shrink from the investigation. We wish it to be shown in what respects we are inferior to others, and we will endeavour to improve it; and where we are superior to others—as I think it can be shown in some respects—we will endeavour to maintain that superiority. I may add that the increase in the receipts for coke has arisen from the additional price, and nothing else. We have not made more, taking the usual scale of a chaldron of coke to a ton of coal.

In reply to the remark of a proprietor that the cost of coal during he half-year had been £7000,

The CHAIRMAN said they had given the consumers a much better article. They undertook to supply 12-candle gas, and no more; but seeing that they had got a new and separate district, and that the consumers must look to them only for their supply of gas, they (the directors) felt themselves bound in honour to give them a good article. They had appointed a chemical referee, an independent person of high standing, who visited the works when he pleased, and made his own returns. What was the fact? They rarely sent out gas that was not equal to 12, 13, 14, 15, and sometimes even 16-candle gas; and, while they were serving the public better, they were at the same time putting more to the reserve fund.

The CHAIRMAN then put the resolution for the adoption of the report, which was carried unanimously.

The CHAIRMAN again rose for the purpose of introducing the specia resolutions with regard to the additional capital, and said, they would bear in mind that in a concern of this kind a certain amount of floating capital was indispensably necessary, and in proportion as their business increased, or the price of articles in which they dealt increased, the capital must also be increased. He would state to them what had been the comparative increase of their business during the last few years. In 1844 the quantity of gas made was 266,000,000 cubic feet; in 1853, it was 587,000,000 cubic feet; or nearly double. The consequence was, they required increased storeage for the gas, and additional coal stores and depôts, without which they could not go on. Another point was, a few years ago, the price at which coals were put into their stores was 13s. 10d. per ton: they could not get them now under 19s. 6d.: an increase in price of fifty per cent. In the next place he came to the storeage, which had been their weak point for some time past. Their retort-houses were sufficient perhaps for some years to come; the coal stores were increased at a moderate expense last year; but it was in the gasholders and large mains that they were most deficient. Last winter they were placed in great peril in consequence of a large gasholder getting out of order, and if they had not been able to repair it at once the results would have been very serious. If they could not supply their customers with gas, other means of getting a supply would be resorted to, and then, of course, there would be no necessity for them to increase the capital. But, as he had said, they were bound in honour to meet the demands of all who came to them. In the next place, seeing that their gasholder accommodation was insufficient for their present business, the first consideration was how they stood in this respect in comparison with other companies around them. Upon that subject they got returns from the chief companies in London. He found that they made on the shortest day 2,887,000 feet of gas, and their gasholder room was only fifty per cent. That was all they had. Another large company made 5,340,000 feet, and their gasholder per centage was 71; but, not content with that, they had increased it to 90 per cent. Another company had 53 per cent., and another 80 per cent. of gasholder room, and they were making provision for the storeage of an additional 100,000 feet. Another had 67 per cent., another 68, another 95, another 79, and another 63. So that they were lower than any other company in point of storeage room; and they found that any derangement in their present gasholders—particularly their large one—endangered the supply to their customers. The next question with the board was as to the extent they should go in providing further storeage, and they set about procuring returns as to the comparative cost of gasholders in proportion to their magnitude. They found that to make a small gasholder would cost £37 per 1000 feet; but as the size was increased the cost per 1000 feet was considerably diminished. Thus a gasholder for 109,000 feet would cost £37 per 1000 feet, whilst one capable of holding 630,000 feet would cost only £22 per 1000 feet; and one capable of holding 1,200,000 feet would cost only £12 per 1000 feet. Therefore, under all these circumstances, and seeing that their district was increased, and that it was being rapidly covered with houses, they felt it would be a wise economy to have a gasholder of large capacity and at proportionately reduced cost. The debts had been contracted, and they must be paid; and, if proprietors came to the decision not to increase the capital, the directors must take other steps. Then a serious question arose as to how the capital was to be raised. The directors wished to avoid making further calls. The method of raising the capital had been a subject of anxious consideration with the board, for on looking to their act of incorporation they found that there were only two courses left open to them, neither of which the board felt willing to adopt. They therefore took the opinion of counsel as to whether some other mode could not be adopted. He would read the questions submitted to counsel, and the replies thereto.

Mr. JOHN BOX, as a point of order, submitted that the question of the dividend ought to be disposed of prior to going into the special matters.

The CHAIRMAN, admitting the irregularity, hoped for the indulgence of the meeting whilst he proceeded with his observations. One question submitted was, whether the directors, with consent of proprietors, would raise money for the purposes of the company by mortgage or debentures under the seal of the company? The answer was, that they could raise no money in that way. Another inquiry was, whether they could issue shares of a lower amount to the existing proprietors, to bear the same amount of dividend as the present shares? The answer was "No." Another was, whether the directors could borrow money upon their own notes under the company's seal? The answer was "No." Another was, whether they could borrow money with the consent of the proprietors at an ordinary meeting? The answer was "No." The replies in general were, that the directors had no power to raise money by way of the means suggested, but that they must confine themselves to the means pointed out by the fifth section of their act of incorporation. Again, it was found that preference shares were inadmissible, unless with

the consent of every individual shareholder. Apart, therefore, from the section to which he had alluded, there were no means of raising additional capital except by the authority of a new act of Parliament. As to the issue of new shares to other persons, it was impossible to do that whilst the present shares were not more than 26 or 28 in the market. They were therefore brought to the point of raising money amongst themselves, relative to which, the opinion had been received that the proprietors at a special meeting might agree to raise a further sum of £90,000, thereby increasing the amount of their shares from £50 to £60 each. And upon the question, whether under the fifth section they could raise the further sum by calls of £1 or more per share, the answer was that the preprietors may, at a special meeting called for the purpose, raise amongst themselves a further sum of £90,000, and that a call of £1 or more per share may be made, subject to the provisions of the 24th section of the act of incorporation, and that such calls may be sued for by the action of debt—no shares to be sold or transferred until such calls are paid. Hence (continued the chairman) they were in this position—they wanted capital, and he had pointed out the only means by which it could be raised; and therefore it only remained for him to ask their assent to the resolution which he would now propose. And let him remind them that such resolution would commit them to nothing: it would be increasing the shares from £50 to £60 each, but it did not commit them to the payment of the £10 additional; that must depend upon themselves entirely, whether they called for it or not. It was a matter for them to decide upon from time to time, as necessity required it. All he now asked was that they should increase the amount of their shares from £50 to £60 each, for which purpose he would propose the following resolutions:—

Additional Capital.—"That this company's present capital of £450,000 paid up is insufficient for the purposes of the act of incorporation, and for carrying on this undertaking; and that, in consequence thereof, a further or other sum of £90,000 be raised and contributed among the proprietors in the share or proportion of £10 additional upon each of the present shares, in pursuance of the powers contained in the fifth clause of the act of incorporation."

Call.—"That for the purpose of raising and contributing such further or other sum of £90,000 in money, in the share or proportion of £10 additional upon each of the present shares, the first call of £2 per share, in part thereof, be and the same is hereby made upon the several subscribers and proprietors of this undertaking, according to their registered number of shares; and that such call be paid into the hands of the treasurer, R. C. L. Bevan, Esq., No. 54, Lombard street, London, banker, by two instalments of £1 each, the first one before Nov. 1, 1854, the second on or before March 1, 1855, and that due notice thereof be given in manner directed by the act of incorporation."

He would merely add, that they were not now asked to advance the money, but only to put themselves in a position to say at some future time such sum shall be paid.

Mr. R. A. Gray said, with regard to further capital, it was obviously required to extend the business of the concern, and the money must be had in some shape or other. He presumed that every indulgence would be shown to proprietors to whom it might be inconvenient to pay the calls at a fixed time. He was gratified to hear the statement of Mr. Box, showing that the concern was in a more prosperous state than for many years previous. That gentleman had shown that they were getting 4d. or 5d. per 1000 more profit upon their gas than they did formerly, which was no doubt in a great measure attributable to the arrangement of the separate districts to each company. He was quite sure that with economical management this company would speedily resume its former prosperity. Inquiries had been made with regard to the leakage; it had been great; but it was satisfactory to find that it was now very materially diminished, and he had no doubt other savings and improvements would go on in like manner. They had no doubt lost considerably by the imperfect state of their meters, as in some instances they had been found to work from fifteen to twenty per cent. to the disadvantage of the company. It could not be disputed that they must have more gas room. It was known that almost all gas companies laboured under the disadvantage of insufficient storeage for gas, which rendered it necessary to draw the retorts every three or four hours, instead of allowing them to remain, as they ought to do, six or seven hours, which resulted in a less quantity of gas being obtained, whilst the consumption of coal was increased. These were disadvantages which the directors sought to remedy, in the first place by increasing the storeage capacity; and, as their business increased, they must necessarily enlarge their mains. He hoped the proprietors would see that it was to their interest to agree to the resolution, which he had great pleasure in seconding.

Mr. Naish said, he was gratified to hear of the diminution of the leakage, but in the country they would have been alarmed at such an amount, although he admitted that in London there were so many disturbing causes calculated to create leakage. It could not, however, be denied that their shares were very much depressed in the market, and for that reason he felt unwilling to increase the capital. For his own part he would prefer a reduction of dividend to two per cent. rather than call for fresh capital, and from that source to carry on their extensions as circumstances required; and he begged to move an amendment to that effect.

Mr. Brady, from Bristol, seconded the amendment.

Mr. R. A. Gray remarked, that withholding the dividend would no doubt be a serious inconvenience to many proprietors, especially to those widows and others whose chief income might be derived from the dividends of the company.

A Proprietor suggested that it should be left optional to reduce the dividend or pay the further capital upon the shares.

Mr. Webb, of Bristol, complained that the ten directors of the company were receiving £1000 from a badly paying concern. He thought the amount——

This remark was received with such unequivocal marks of disapprobation that the subject was not further mooted.

Mr. John Box asked whether the directors had tried to raise the money on loan?

The Chairman: We made application to one of the large insurance offices in London, and we went so far as to offer our own personal security. They requested to be furnished with a copy of the act of incorporation, and, having consulted that, returned an answer that we must raise the money in the way that was there pointed out, and in no other way.

Mr. John Box: At Christmas, 1841, you had a loan of £15,000; at midsummer, 1842, £13,000; at Christmas, 1842, £13,000; at midsummer, 1843, £10,000; at Christmas, 1843, £10,000; and so I might go on for a number of years further; but, to take a recent period, last half-year you had a loan of £4000.

Mr. R. A. Gray: That bears no analogy to the present case. We know that companies, in order to meet the dividend before the money comes in, go to their bankers for a loan for that purpose, which is a mere temporary thing, whereas this new capital is a permanent thing.

M. Box said it was for that very reason that he objected to the measure. It would be a permanent burden upon the concern, which he thought they were not in a condition to bear; for he would ask in what position they would find themselves if a competition started up? and he had understood that a company had been projected at Rotherhithe, owing to the meters of this company registering so badly. He agreed with the honourable proprietor (Mr. Gray) that the directors must have money; the question was, the best way in which to get it. He believed there was a plan of getting it without resorting to a reduction of the dividend, to which he could not give his support, as no doubt many persons had made their arrangements in anticipation of the dividend from this concern; and therefore, if they at all entertained the notion of reducing the dividend, it ought to be prospective. But he thought there was a way of raising the money by loan, which he had shown was no new thing with the directors; and when they had not loans they had calls coming in; and he believed that many of the dividends had been paid out of capital, inasmuch as calls were coming in to meet them. But he was happy to say they were now in a different position. They had sufficient to pay the dividend, and carry forward a surplus to the next half-year. This showed that they were progressing, and he had no fear but that they would continue to do so if they did not commit some suicidal act. But, with an increased capital and an enlarged dividend upon it, what would be their posision if they were exposed to competition? If the directors could by any possibility raise the money for a limited period, he would give his sanction to it. He was opposed to a permanent increase of the capital, and he did not think they had power to increase the present amount of the shares. Having read the fifth section of the act, Mr. Box remarked that it was evident, from that, there was no intention to raise the amount of the shares, and therefore to all intents and purposes this would be a second capital. He admitted the readiness of the directors to look their difficulties in the face, which was always the best thing to do; but he did not think the proposed increase in the amount of the shares was a desirable way of meeting the thing; because, for one thing, in the event of the removal of the present board, they had no guarantee that their successors would not press the calls to the utmost. How it should be found out in the present day, when their affairs were in an improved state, that they could not get a loan of £15,000 or £20,000 to meet their present exigencies, was to him a parable.

Mr. Gibbes: You have been told, over and over again, that we have tried every means of raising money without making a call. The original framers of the act must have had the idea that, if the capital of £450,000 was not sufficient, the directors would have the power to raise the shares to £60, otherwise how is it that the sum is limited to £90,000? We are shut out from the creation of new shares by our shares being at 50 per cent. discount in the market. We have now come to our last resource, in which we are fortified by the opinion of one of the first barristers of the day.

Mr. Williams asked whether the whole £90,000 would be required?

Mr. Gibbes: I do not think it likely during the lifetime of any of us.

Mr. Bailey supported the proposition of Mr. Naish, that the money should be taken from the dividends as required from time to time.

Mr. John Box inquired what sum was required immediately?

The Chairman replied, about £20,000, viz., £14,000 for the large gasholder, and some £5000 or £6000 for mains. The directors had received from their engineer a report classified under three heads—viz., first, works indispensably necessary; secondly, works that were advisable; and, thirdly, works which were desirable, but which might, without injury, be postponed. Under the latter head might be mentioned a steam apparatus for lifting coals at Vauxhall, the same as at Greenwich, as they had an idea of getting larger barges up to Vauxhall. Another matter was hydraulic mains and fittings, and these it had been necessary to order at an expense of £449; and an additional supply of gas retorts at £1140. Again, an additional storehouse at Greenwich was advisable, but not indispensable; also, a condenser and wet-lime purifier at Vauxhall were necessary. The large gasholder was indispensable. They had been obliged to put down new mains in Southwark, and they must not venture another winter with the same mains, as they could not give an adequate supply. The total expenditure proposed was £35,000, of which £27,000 was reported to be absolutely indispensable to the proper conduct of their business. He trusted the proprietors would allow this resolution to pass, reserving in their hands the power of fixing when the money should be raised.

Mr. R. A. Gray thought it would be well to make a call of £2, and not make a further call for some considerable time.

Mr. John Box begged to thank the chairman for the details he had given them, from which it appeared that they must have more money. The question was, the most easy mode of raising it. He objected to the increase of the capital of a concern which was already overburdened. There was something about this business which was to him

mysterious, namely, that they should have been building and extending their works up to the present time, and where had the money come from? And yet all had been done, and, he supposed, all paid for, and the last call was declared to be a final one. They were writing off plant each half-year, and it was mysterious to him that the directors should think it necessary to take the opinion of counsel upon that which they had done a score times before. The great objection he had to the proposition was, the placing of a heavy permanent burden upon the concern. They could not ensure themselves against a rival company, and he considered the directors would have done better had they acted as they had on former occasions, namely, borrowed £10,000 or £15,000 for present purposes, paying interest upon it, rather than put a permanent burden upon the concern. He would support the dividend as at present proposed.

Mr. HORNER (a director) said, an extension of the works was called for by the extension of their district, and hitherto they had worked at a disadvantage for want of sufficient gasholder room. It was certain that an ample return would be made for the expenditure they were asked to incur, so that it could not be regarded as a burden upon the concern. With regard to borrowing the money, it had been clearly shown that they had not the power to do it in the way that had been suggested by Mr. BOX. There was another point to be considered: their business had increased, and that rendered a larger amount of floating capital necessary; £10,000 more of floating capital, at least, was required to work the thing efficiently. How was it they could show a better coal account than any other company in the metropolis? Simply because they had been able to make cash payments, and had got the coals to so much greater advantage. He thought, when they reflected that there was a certainty of a good return for this extra capital, they would not hesitate in voting it. The directors could not go on without the assistance they now asked for; and, if they believed the statement of Mr. Joseph Box (who was well qualified to judge of the matter) that they were in an improving condition, he thought they could not object to a further expenditure, which would bring them a profitable return.

After a few words from Mr. TILLEY, who supported the proposition of the directors,

The CHAIRMAN put the amendment of Mr. Naish for a reduction of dividend in lieu of raising fresh capital, when it was negatived by a large majority.

Mr. JOHN BOX then moved as an amendment that the dividend be at the rate of 3½ per cent., and that the question of raising further capital be postponed.

This amendment, not being seconded, fell to the grouud.

The original proposition was then carried by a large majority, as was also a resolution fixing the call at £2 per share, payable £1 in November next, and £1 in March, 1855.

The dividend at the rate proposed by the directors was carried, and the business concluded with a vote of thanks to Mr. Johnson for his conduct in the chair, and also to the directors for their able management.

DR. LETHEBY'S TENTH REPORT ON THE GAS SUPPLIED IN THE CITY OF LONDON.

TO THE HON. THE COMMISSIONERS OF SEWERS OF THE CITY OF LONDON.

"Gentlemen,—I have the honour to report that the average illuminating power of the gas supplied to the City of London by the Great Central Gas Consumers' Company during the last quarter, has been equal to that of 13·8 sperm candles, or 15·8 wax, each consuming the standard amount of 120 grains per hour.

"These results have been obtained in the usual way, by burning the gas according to the act of Parliament directions, and they show that the illuminating power of the Great Central gas has been nearly 32 per cent. greater than is required by the act of Parliament.

"I have also the satisfaction to state that the chemical quality of the gas has undergone improvement since the last report.

"HENRY LETHEBY, M.B.

"*London Hospital, Aug.* 10, 1854."

THE GAS QUESTION IN LIVERPOOL.

A meeting, convened by the following circular, was held at half-past two o'clock on Saturday, Aug. 12, in the Commercial-hall, Hackin's-hey, Liverpool:—

"*Liverpool, Aug.* 10, 1854.

"Gentlemen,—We are informed that on Tuesday next it is the intention of the directors of the Liverpool United Gas Light Company to make their annual statement to their proprietors.

"The maximum dividend of 10 per cent. has been attained, and it is expected that the reserve fund will have been made up during the last six months, or nearly so; the good management of the company, therefore, can no longer be considered exclusively a matter for the proprietors, but the consumers, it may now be fairly said, have an equal interest.

"You are, therefore, invited to attend a meeting of a few of the largest consumers of gas, to-morrow (Saturday), at half-past two, in the large room, No. 3, Hackin's-hey, with a view to a conference with the directors on the subject of an early reduction in the price, and to request that some definite statement shall be made to the meeting on Tuesday next.

"We are, gentlemen, yours very respectfully,

"JAS. R. JEFFERY,
"R. A. MACFIE,
"WALTER F. MACGREGOR."

The meeting was very thinly attended, there not being more than fourteen or sixteen persons present, namely, Messrs. R. Macfie, J. R. Jeffery, W. F. Macgregor, J. H. Robertson, Dyke, Woolwright, Legge, Williams (Ranelagh-street), H. C. Beloe, T. Reay, F. S. Morrish, Towers, E. Willmer, &c. Mr. R. A. MACFIE presided.

The CHAIRMAN, in opening the proceedings, said, in consequence of absence from town it was only lately that he became acquainted with the state of matters on the great question which they had then assembled to discuss. He thought that any one acquainted with the state of the matter would see that then was the time for their consulting together, as to what ought to be done with regard to the price of gas in Liverpool, and the position of the public with the Liverpool Gas Company; they would see by the wording of the circular convening the meeting, and which was signed by three considerable consumers of gas, carrying on business of different kinds, that it was a friendly document. No one amongst them had the least feeling of hostility to the gas company. (Hear, hear.) He spoke for himself, when he said that the interests of the public were identical with those of the company, and it would be a pity that they should have any cause for hostility towards it. An opposing company could only cause an increase of price in the gas to the public. That was his opinion—he did not commit any one to it; but, if it should be the wish of the meeting that a deputation should wait on the company, he thought that that would be the feeling which would actuate the deputation. He understood that when the maximum dividend of 10 per cent. was attained, and when the reserve fund reached a certain amount, that the gas company was bound to reduce their price—that, in fact, when that state of matters arose, the gas company was a public committee, standing in much the same position, with regard to the public, as the water committee.

Mr. JEFFERY said that the sole object for which the meeting had been convened was clearly stated in the circular, of which every gentleman had received a copy. It stated that as the maximum dividend of 10 per cent. had been attained, and the reserved fund almost made up, if not quite so, the provision of the act of Parliament, which fixed the dividend at 10 per cent. and the reserved fund at £13,000, should be carried out by a reduction in the price of gas. He might state what gave rise to the introduction of the 10 per cent. clause into the act. Those of them who had been in Liverpool sufficiently long to remember the year 1834, would recollect that the old gas company then in existence had lost all its capital, except that which existed in the "plant," and they asked the consumers, who were then agitating for a consumers' company, to accept them as such; and, as a guarantee that they would be a consumers' company, they agreed to have a clause inserted in their act, providing that when the maximum dividend of 10 per cent. was attained, a reduction in the price of gas would follow as a consequence. That was twenty years ago, and they had never, until within the last six years, arrived at that happy position as gas consumers to have the clause in any way operative. He would not detain them by any investigation into the cause of that delay, whether it arose from mismanagement or otherwise. He would not go into the past: their object in meeting that day was to determine their course for the future. The maximum dividend had been attained, and the consumers became, as the circular stated, equally interested with the proprietary. There was no competition against the company, and the consumers had no guarantee against extravagant expenditure, whether it arise from negligence or other causes. A counterpoise was absolutely necessary to the good management of any company, were it for the manufacture of gas or any other thing. The counterpoise in this case, he took it to be those whose interest was in the economical production and purchase of the gas. The meeting was to take place on Tuesday, when the company would announce to the proprietors what was the state of the reserved fund, and whether they would make a reduction or not. They might be silent on the subject, or they might be induced by the meeting then assembled to announce a reduction in the fund for the future. Liverpool was the largest town in the kingdom supplied by one company. The company here had the largest consumption of gas, and the power of producing it at the minimum rate, wherever it could be produced; but, if they took into account the consumption of gas, they would find that they were not the cheapest supplied in the kingdom. He believed there were towns where the consumption was comparatively insignificant, and the difference of price almost nothing. That was a state of things that ought not to continue. Their object was not in any way to damage the interest of the proprietors or injure the property. On the contrary, in arranging for a further reduction in the price of pas, he believed that they were rendering more secure the property of the proprietors of the company. Judging from the past, he came to that conclusion; for on every reduction of the price, consumption had increased, and accordingly the dividends had greatly increased with the increased consumption. It remained, then, for them to consider what steps it would be judicious to take under existing circumstances. Those gentlemen whose names were attached to the circular thought that a discussion similar to that on which they were then engaged, should take place, with a view to a deputation conferring with the gas company, previous to the meeting of the proprietors on Tuesday. At such a conference they might be able to make some suggestion that would be beneficial for the production of cheap and pure gas, because he would be as cautious in making any proposition to the prejudice of the proprietors, as he would be to the prejudice of the consumers. Whilst justice should be done to the one, he was anxious that equal justice should be done to the other. He conceived they were labouring under a great injustice in the out-townships being supplied at the same price that that they paid in Liverpool, close to the retorts. It was unreasonable that that state of things should continue, (Hear, hear.) There should be, in his opinion, an increase of price in proportion to distance. (Hear.) Let them draw their circle at the boundary, for instance, and for every mile or so beyond it, let them charge additional in proportion. He was conscious that under the present act of Parliament the company had no power of charging beyond the parliamentary boundary more than 4s. 6d.; but they had the power of reducing the price within the parliamentary bounds, without reducing it without them. They had that power at present, and probably at some future time, when they went to Parliament for additional powers, it would be well to bear in mind that principle of injustice. A matter had occurred to him, and his attention had been the more particularly drawn to it by an expression that fell from one of the proprietors of the company six months since. One of the proprietors complained to the directors that they were dealing un-

justly with some of the proprietors, and in what way? Because they did not pay off their mortgages, the money borrowed at 4 per cent., and borrow from the proprietors to whom they would pay 10 per cent. Was it to be wondered then that the consumers should meet to express their indignation at such conduct? The company had the power to borrow £100,000. They had increased that power in borrowing £20,000.

Mr. Beloe begged that, as auditor, appointed by the ratepayers to look into the accounts from year to year, he might be allowed to make a few observations. He had only that morning heard of the meeting, when he was requested by Mr. Jeffery to attend in his official capacity. He was therefore present as a perfectly impartial member of the meeting. He was delighted to hear that it was no hostile meeting, held with a view of getting up some company in opposition to the present company, but with the simple object of endeavouring, fairly and kindly, to obtain a reduction in the price of gas in Liverpool. There was much to be said on both sides of the question. The company had the power to divide 10 per cent., and to accumulate a fund of £13,000, as a guarantee for the future dividends being made equal to — per cent. The consumers might say, perhaps, that they were carrying the law a little too far in insisting on having every penny of the reserve fund in their hands, before they carried out the object provided by the Government, by making a reduction in the price of gas. But to that the company had a very strong argument to urge, and it was this:—A very large portion of their capital had been raised by public auction of the shares to the gentlemen of the town of Liverpool. These shares had realised a price varying from 75 to 90 per cent. premium; and to that extent the company were the trustees of the public. They had paid 75 per cent. premium for the shares on the guarantee that they were to be entitled to 10 per cent., and if they only received 8 or 9 per cent., there being no adequate reserve fund laid by, they would consider themselves hardly treated. He was only stating that argument *per contra* to what had been urged on the other side. The next grievance, very properly stated by Mr. Jeffery, was the supply of gas to the out-townships at the same price as it was supplied to the residents of Bold-street. Application, however, had been made to the Recorder, and he declared that, though it was a fatal thing, the company being established for the manufacturing of gas for supplying the public of the town of Liverpool and certain townships, the people of Aigburth were as much the public as the people of Liverpool; and until that clause was amended, any person could compel the company to go to those places. That was a hardship; but he was inclined to believe that, the deputation representing that hardship, the company would take steps to have the clause amended, or, at all events, that they would at once reduce the price to the large consumers of the town, and still retain, what he believed they had a right to do, the maximum price to the out-townships. In conclusion, Mr. Beloe expressed his pleasure at the peaceful character of the meeting, and declared that he was sure the deputation would be met in a friendly spirit by the directors.

Mr. Reay expressed his belief that the price should be the same in the town and out-townships. If it were reduced in the one, it should be reduced in the other.

Mr. Beloe did not consider such to be the fact.

The Chairman asked what ratio the profits bore to the whole estate of the company?

Mr. Beloe: The profit and loss account last year stood thus—£130,000 receipts, and £74,000 expenses, the balance being profit.

The resolution was then put and carried, there being one dissentient voice.

The Chairman thought the public were indebted to Mr. Jeffery for the manner in which he had brought the question forward; and also to Mr. Beloe, for the information he had furnished them.

The proceedings terminated with the usual vote of thanks to the chairman.

DEPUTATION TO THE DIRECTORS OF THE GAS COMPANY.

At three o'clock on the following Monday, the deputation waited upon the directors of the Gas Company, at the Gas-offices, Newington. Mr. Jeffery announced to the chairman that the deputation represented the largest gas consumers, appointed at a meeting to wait upon the directors for the purpose of ascertaining their intentions with regard to a reduction in the price of gas. The chairman stated that the company had taken the matter into consideration, and he was happy to state that they were now in a good position, thanks to their own efforts, and their having made a most advantageous contract for the supply of cannel. The reserve fund, however, was not full by nearly £3000; but, as last year they had been able to carry over to the reserve fund a sum of £8400, he had much pleasure in informing the deputation that they had resolved to reduce the price of gas to consumers within the bounds of the parliamentry borough to 4s., after the 1st of January next. The deputation urged upon the directors that the reduction should take place at an earlier period, and expressed their belief that the public would not be satisfied, seeing that the sum to be charged was not so low as the maximum sum proposed to be charged by the Guardians' Company. They suggested that any reduction made by the directors would, no doubt, be made up by the increase in the consumption. The directors declined to accede to any reduction before the time stated. The deputation suggested that the borrowing powers should be fully exercised previously to calling in any more capital; but the directors declined to pledge themselves to adopt this cause, promising, however, that the subject should receive the fullest consideration, with every regard for the interest of the consumers as well as the proprietors. The next question brought forward by the deputation was the propriety of having one or two persons with seats upon the board, as representatives of the consumers, but without the power of voting as to the disposal of money, which the deputation considered would inspire greater confidence upon the part of the consumers. This, however, the directors declined to entertain. Finally, the deputation suggested that inspectors should be appointed for the meters. The directors expressed no objection to this step, stipulating that the parties appointed should be men fully competent to perform their duties. This concluded the conference, and the deputation withdrew.

GENERAL MEETING OF THE GAS COMPANY.

The usual half-yearly meeting of the proprietors of the company was held in the offices of the company, Newington, on Aug. 15. The chair was occupied by Mr. C. W. Reade, chairman of the board. Among the gentlemen present, were Messrs. John Buck Lloyd, mayor; G. H. Lawrence, S. H. Thompson, Hardman Earle, Thos. Thornley, M.P.; T. Carson, solicitor to the company; A. King, engineer; H. Steele, manager; Mather, Fosbery, Mann, Radley, &c. &c.

The Chairman said the last time the proprietors met he had intimated to them that the directors hoped soon to be in a position to announce that a reduction in the price of gas would take place. He was happy to say that the concern had prospered, and that they were now in a position to say that a reduction of 6d. per 1000 cubic feet would take place from and after the 1st of January, 1855, to consumers within the parliamentary borough. The public lamps, of course, would be included in that reduction. He thought it only justice to the committee of directors, to say that this was owing, in a great measure, to their foresight and prudence in making contracts for cannel at a time when prices were low, for a lengthened period; therefore they felt confidence in making that reduction, which was in accordance with their act of Parliament, as they expected that before the 1st of January their reserved fund would be full. It was now £3000 short, but they expected by that time it would be full; therefore they should be acting in strict accordance with their act of Parliament. The proprietors had heard that various deputations had waited upon the directors, and they had received them with attention, and heard what they had to say. The deputations seemed satisfied with the answers they got; and, no doubt, a good feeling existed between the directors and the consumers, as the directors had strongly impresed upon them that they were acting for them as well as for the proprietors. (Hear, hear.) The directors were entirely actuated by a desire to do justice to both parties. Their report was very full; and among other matters included in it, which would come before the meeting, was a statement in reference to the charge which had been brought against the company of making inferior gas. As this charge had, however, been retracted, he should not say anything more upon that point. He would call upon the secretary to read the accounts, which would show a very satisfactory statement.

The Secretary read the statement of accounts, which was unanimously adopted.

The following report was then read:—

The directors have now to submit to the proprietors the abstract of the company's accounts for the year ending June last.

The proprietors, at their meeting in February last, declared a dividend at the rate of £5 per cent. for the preceding half-year, on the consolidated stock of the company, and of £1. 5s. per share on the paid-up £25 shares (now converted into stock), and of 2s. 6d. per share on each of the £25 A shares. The payment of this dividend required that the sum of £22,521. 5s. should be taken from the amount of assumed profits of the company for the half-year ending Dec. 31 last.

The profit and loss account for the entire year ending June 30 last, and now submitted to the proprietors, shows that the profits of the company for the year amount to the sum of £53,475. 11s. 7d.; deducting from which amount the above-mentioned sum of £22,521. 5s., paid in dividends in February last, there remains the sum of £30,954. 6s. 7d. applicable to the payment of dividend and to the reserved fund.

The directors recommend that a dividend for the half-year ending June 30 last be now declared at the rate of £5 per cent. on the consolidated stock of the company, and of 2s. 6d. per share on each of the £25 A shares on which a call of £2. 10s. has been paid. The payment of this dividend will require a further sum of £22,521. 5s., and will leave the sum of £8433 1s. 7d. to be carried to the credit of the reserved fund.

By the 38th section of the company's act it is provided that there shall be a reserved fund equal in amount to a per centage of £3 upon every £100 of capital raised by the company, and actually paid up, which fund is to answer any deficiency which may at any time happen in the amount of divisible profits of the company, or to meet any extraordinary claim or demand which may at any time arise against the company, and such fund, if reduced or exhausted, may again be raised to the same amount of per centage. The total amount of capital so raised by the company, and actually paid up at the present time, is £450,425, and 3 per cent. on this sum would amount to £13,512. 15s., which would constitute the reserved fund contemplated by the act of Parliament.

The proprietors, at their annual meeting in August, 1853, directed the sum of £2046. 0s. 9d. to be carried to the reserved fund, being the first moneys applicable to that purpose since the passing of the company's act. On this sum, invested in Consols, dividends have been received amounting £8433. 1s. 7d., applicable out of the surplus profits of the last year, the rest to £26. 17s. 10d.; and adding to these the above-mentioned sum of served fund of the company will amount to £10,506. 0s. 2d., leaving the sum prescribed by the act of Parliament as the reserved fund deficient by £3006. 14s. 10d. only. The directors cannot but congratulate the proprietors at being enabled at the present time to carry so large a sum as £8433. 1s. 7d. out of the past year's earnings to the reserved fund.

The directors, in their report read at the annual meeting in August, 1853, ventured to express a hope that, with the continuance of the general prosperity of the town, the amount to be carried to the reserved fund, at the end of the company's then current year, would be such that the period for reducing the price of gas might be then announced. The directors have now great satisfaction in finding, by the result of the company's business during the past year, that they were not too sanguine in their expectations; and, as the sum of £3006. 14s. 10d. only is now required to fill up the reserved fund of £13,512. 15s., and as the directors entertain no doubt that the profits of the current half-year will provide a balance sufficient for the purpose, after providing for the usual dividend in respect of such half-year, they consider that the period of such reduction may be announced at this meeting.

The amount of reduction is a question not free from difficulty, regard being had to the twofold obligation which the directors feel that they have to discharge—namely, to the proprietors on the one hand, and the consumers on the other.

The modern acts regulating gas companies, and this company in particular, differ from those regulating most other companies: the amount of dividend is limited, and when the net profits of the company exceed the amount requisite for that purpose (the reserve fund being full), the price of gas must be reduced. This being a compact between the proprietors and the gas consumers (and it was especially so after mutual discussions and by express arrangement as regards this company), not only the original shares of the company have been dealt with and passed from hand to hand upon the faith of its strict observance, but a large class of shares have been sold by the company by auction at high premiums, in consequence of the confident belief entertained by the purchasers that, in any reduction of the price of gas, due regard would be had to the securing to them the continuance of the dividend authorised by the company's act, and in the expectation of which (almost amounting to assurance) they had paid such high premiums, which have been expended for the benefit of the consumers, inasmuch as those premiums are applied in extension of the works, and upon which no dividend is payable.

The directors, therefore, in recommending the proprietors to announce a reduction in the price of gas, to take effect from Jan. 1, next, have endeavoured to bear in mind their duty to all parties, consumers as well as proprietors, and to suggest such a reduction as would meet the reasonable expectations of the former, and at the same time not jeopardise the prescribed dividend, and a continuance of a sufficient reserved fund as its guarantee; and they have also had regard to the fact that the contracts of the company for cannel during the last few years had been upon terms much lower, as regards price, than could now be obtained. The reduction which the directors would suggest is 6d. per 1000 cubic feet to all consumers within the parliamentary borough, with a rateable reduction on the public and dock lamps within the same limits, such reduction to take effect on and from Jan. 1, 1855.

The directors do not recommend any reduction in the price of gas to the consumers in the out-townships; and they trust that the fact of the cost of supplying those districts being greater than that of supplying the borough, and bearing more heavily upon both the capital and annual expenditure of the company, will be deemed a sufficient reason for this determination.

The directors cannot close their report without adverting to the charges recently made against the company of supplying gas of inferior quality. So long as such charges were anonymous the directors did not deem them worthy of notice, well knowing that they were totally unfounded in fact; but, in the month of May last, these charges assumed a more distinct and authoritative character, and in the early part of that month the directors received an official notice from the chairman of the lighting committee of the town council, that the gas of the company was not equal to the contract standard (being the standard fixed by the company's act of Parliament), and also a copy of a report made by Mr. Newlands, the borough engineer to the watch committee, of which the following is a copy:—

"TO THE CHAIRMAN OF THE WATCH COMMITTEE.

"Sir,—Having, in accordance with the instructions of the committee, made repeated experiments in order to test the quantity and quality of the gas supplied to the public lamps, I have now the honour to report to you the conclusions to which they have led me:—First, that the gas at present supplied by the company to the street lamps does not produce a sufficient light. Second—That the gas company, should, therefore, be called upon, in the terms of their contract, to supply to each batswing burner such a quantity of gas of such a quality as shall produce a light equal in intensity to 18 candles, of the quality, size, and weight stipulated in their contract.

I have the honour to be, Sir, your obedient servant,

"JAS. NEWLANDS."

Mr. King, the engineer of the company, having unhesitatingly assured the directors that the gas had never been below the prescribed standard, they applied to the watch committee for the particulars of Mr. Newlands's experiments, and also requested that a further series of experiments might be made by Mr. Newlands on the gas of the company, and that Mr. King might be allowed to be present thereat; but these particulars were refused, and it was replied that Mr. Newlands's apparatus had been taken to pieces. The directors again applied for the particulars, urging that it was only right to the company and the public, who were deeply interested in the question, that Mr. Newlands's apparatus and mode of testing should not be withdrawn from investigation; and proposing that the apparatus should be reconstructed at the expense of the company, and that their engineer should have an opportunity of forming an opinion on its efficiency, and also on the mode of operating adopted by Mr. Newlands. The directors further consented (to meet a suggestion of the committee) that the apparatus of Mr. King might also be made use of by Mr. Newlands at any time for the purpose of testing the gas.

The particulars of the experiments were not granted, in reply to this communication; but the reconstruction of Mr. Newlands's apparatus, and a new series of experiments therewith, were agreed to by the lighting committee.

On June 19 last, a series of experiments were made by Mr. Newlands, with his apparatus, in the presence of Mr. King. The latter at once saw that the apparatus and the mode of manipulation of the borough engineer were both defective; and he then convinced Mr. Newlands that such was the case, and that the errors affected the result to the injury of the company.

Mr. Newlands made a report to the lighting committee admitting the errors, but of this report the directors have not been able to procure a copy; however, they cannot complain of any want of candour in the lighting committee, in not at once acknowledging that the charge against the company was unfounded. A deputation of directors, with Mr. King, met a sub committee of the lighting committee at the Townhall, on the 29th of July last, when the subject was fully discussed, and all parties were satisfied that the charge had been made in error; and on the same day the lighting committee passed the following resolutions:—

"At a meeting of the lighting committee, held on Saturday, July 29, 1854—present, JAMES A. TOBIN, chairman—

"A deputation from the gas company having attended the gas subcommittee on the subject of Mr. Newlands's experiments, and the report founded thereon, and the committee having before them the further report of Mr. Newlands's admitting that defects were found to exist in parts of the apparatus, by which the experiments would be affected—

"Resolved,—That, as the sole object of this committee has been, and is, correctly to ascertain the quantity and quality of gas supplied, they deem it fair and right at once to inform the gas company of the above facts, and to express the regret of this committee that any report should have been made based upon experiments with instruments subsequently found to be in some respects inaccurate.

"And, further, that such report would have been forwarded to the company, had not the committee been informed that implicit reliance might be placed upon the accuracy of such apparatus.

"Further resolved,—That the apparatus be completed in the most perfect manner, and that every care be used to test and check the accuracy thereof; and that the experiments be forthwith proceeded with and continued from time to time.

"(Extracted from the proceedings.)

(Signed) "WM. SHUTTLEWORTH, Town Clerk.

"The Liverpool United Gas Light Company,
Cornwallis-street, July 29, 1854."

Your directors cannot but believe that the result of this investigation will be highly satisfactory to the proprietors and consumers. The directors can most truly assert, that on no former occasion whatever has there been any attempt made to manufacture gas of a quality inferior to that required by the act; and, at the risk of being somewhat prolix upon this subject, the directors would lay before the proprietors the following report of Mr. Barlow, an eminent engineer, on the gas of the company:—

"*London, June* 30, 1854.

"I hereby certify that, on the 24th of May last, at the request of Alfred King, Esq., engineer to the Liverpool United Gas Light Company, I made three careful experiments in the photometrical laboratory of the company's office, in Newington, upon the illuminating power of the gas then being supplied to the public. Each experiment was continued for twenty minutes—observations of the illuminating power and consumption of gas being made every minute, and the actual loss in weight of the candle used being ascertained at the termination of each experiment. The following were the results obtained:—

"EXPERIMENT No. 1.—The burner employed in this experiment was one of the ordinary Liverpool street batswing burners, which had actually been used for some time, as was proved by the manner in which the orifice was corroded and burred up. The quantity of gas consumed in twenty minutes was 1·330 feet, or at the rate of 3·990 feet per hour; and the illuminating power of the gas with this burner, calculated on a consumption of 4 feet per hour, was equal to 18·92 spermaceti candles, consuming 120 grains per hour.

"EXPERIMENT No. 2.—The same burner was employed in this experiment as in the first, the quantity of gas consumed being at the rate of 1·334 feet in twenty minutes, or at the rate of 4·002 feet per hour. The illuminating power of the gas, calculated on a consumption of 4 feet per hour, was equal to 20·434 wax candles, consuming 120 grains per hour.

"EXPERIMENT No. 3.—Feeling assured that the burner used on the two previous experiments was not a fair sample of the burners in which Wigan cannel gas was ordinarily consumed, I changed it for a well-constructed union jet or fishtail, the consumption of gas in which was 1·300 feet in twenty minutes, or at the rate of 3·900 feet per hour. The illuminating power of the gas thus burnt, calculated on a consumption of 4 feet per hour, was equal to 23·784 wax candles, consuming 120 grains per hour.

"I also examined the books of the company, in which is registered the account of the quantity of gas made and cannel used, and I ascertained therefrom that the yield per ton of cannel at the period when these experiments were being made was slightly in excess of the general average yield, from which I infer that the mean illuminating power of the gas usually supplied in Liverpool will be somewhat higher than is indicated by the above experiments.

(Signed) "THOMAS G. BARLOW,
Civil and Consulting Gas Engineer."

In such an extended concern as this company now presents, it is impossible that there should not be instances of defects in pipes and fittings, which may occasion a temporary and partial diminution of light, and which may lead parties to suppose, though erroneously, that the gas itself is defective in quality. These instances the directors do all in their power to remedy by the most stringent instructions to their officers and servants to afford the most prompt and unremitting attention to all complaints.

In conclusion, the directors have to state that four of the directors, viz., Dr. Brandreth, Mr. James Bateson, Mr. Joseph Cooper, and Mr. Daniel Mather, retire from the direction, but are eligible for re-election.

C. W. READE, Chairman.

On the motion of the CHAIRMAN, the usual dividend was passed, and the outgoing directors and auditor re-elected.

The CHAIRMAN observed that he thought they never before had a more satisfactory report and statement of accounts. (Hear, hear.) The public feeling among the consumers would now be, and had indeed been, friendly. He thought the reduction they were about to make would satisfy all reasonable consumers, and that they might look forward to a state of quietness; and agitation, he hoped, would be stopped, because, when unnecessary expense was caused to the company, it of course retarded any reduction, and saddled the public with foolish cost. (Hear.) They had spent many thousands in combating opposition, but he hoped that that time was at an end, and that the public would see that the directors had their interest in view as well as their own. Those who knew the directors would know that they had no sinister motives in view, but that they merely wished to do what was right between man and man. (Hear.) He hoped the public perceived that the directors had done, and would do, everything for their interest, as well as for the interest of the proprietors.

Mr. THORNLEY, M.P., expressed his gratification that a reduction was about to take place.

Mr. RADLEY asked if the attention of the directors had been called to the wish of the public that the meters should be tested?

The CHAIRMAN said the directors had no objection at all to having a proper officer appointed for that purpose—a man fully competent to the duty, under certain regulations compatible with proper management and justice to all parties. It would take a very great responsibility off the shoulders of the directors to have such a public officer appointed to whom parties could apply.

Mr. RADLEY asked, when they called in the increased capital, was it their intention to pay a dividend upon that capital?

The CHAIRMAN: No doubt—we would be compelled to do so.

Mr. RADLEY said his reason for asking the question was, that it seemed to him, if they called in the increased capital, the directors

would perhaps see the propriety of placing six per cent. dividend, or some reduced rate of dividend, upon it for one or two half-years, as by that means the consumers would be taken into consideration. For a number of years the consumers had not been taken into consideration, and he would therefore suggest some slight reduction.

The CHAIRMAN said they were tied down by their act of Parliament, and could not make any reduction. Besides, in the long run, the public would be no gainers at all by such a reduction. They should put £45 less to the account of public credit than they did now.

Mr. RADLEY said, what he stood up for was, that the consumers should be taken into consideration.

The CHAIRMAN said he was alluding to the consumers. They would lose £45 upon every £100 in selling the shares. But in any case they had not the option.

Mr. HARDMAN EARLE: And it would be just as broad as long. They would not sell for as much in the market as they do now.

Mr. RADLEY made the suggestion in reference to any new capital for new works.

Mr. EARLE said, when they were going to Parliament for new capital, it would be time enough to consider that question. In reference to the examination he wished to remark, that the directors would make the usual and necessary condition, that parties would pay their bills first, as otherwise it would be made a perpetual excuse for the purpose of putting off payment. (Hear, hear.)

Mr. Alderman COOPER said, to show Mr. Radley that they had not called up shares as they might have done, they had borrowed £63,000, at 4 and 4½ per cent., and they had only called up £3000 of shares.

Mr. RADLEY said, public opinion decidedly was, that any new capital which might be called up at any future day, should not pay a dividend of 10 per cent.

Mr. ADDISON asked upon what proportion of capital was that dividend paid?

The CHAIRMAN: About £100,000.

Mr. ADDISON: And how much does that reduce the dividend?

The CHAIRMAN: To about 6½ per cent.

Mr. ADDISON: Then the public notice of 10 per cent. is a fallacy?

The CHAIRMAN: Just so. It is £10 per share.

Rev. Mr. MAYNARD moved, that as the report this half-year was one of unusual importance, it be printed and circulated among the proprietors.

The motion was adopted without opposition.

Thanks were then given to the chairman, and the meeting separated.

SUNDERLAND SUBSCRIPTION GAS COMPANY.—The annual and *last* meeting of the shareholders of this company was held on the 30th ult. As the press were not admitted, we are unable to give a detailed report of the proceedings; but we understand no dividend was declared upon the past year, several large outstanding debts of the company having yet to be paid, to do which, the whole of the profits of the past half-year, and a further call of £4000 or £5000 upon the shareholders, will be necessary.—*Sunderland Times.*—[This company has for some time past been selling gas at 3s. per 1000 feet.]

GAS WORKS IN CALIFORNIA.—The success attending the recent establishment of gas works at San Francisco, as well for the public comfort as for private enterprise, appears to have stimulated the mayor and corporation of Sacramento to adopt similar measures for lighting their city, which is the second in the state, and daily increasing in prosperity. Streets and buildings of a very superior kind are rapidly springing up. Gas is much required, and a contract is entered into for the immediate supply, which is undertaken by some experienced parties in this country, and probably will be submitted to the public in the form of a company.

VICTIMS OF THE CHOLERA.—We regret to have to record the death of two gentlemen long and honourably connected with the gas world, viz., Mr. R. E. Gooch, accountant to the Equitable Gas Light Company; and Mr. Samuel Church, the well-known engineer to the City of London Gas Works, Dorset-street. Asiatic cholera, in its worst form, was, we understand, the cause of death in each instance. Both gentlemen were highly and deservedly esteemed, and their loss cannot fail to be greatly lamented. Mr. Gooch died on Sunday, the 20th ult., and Mr. Church on the Monday following.

Price Current.

CASTINGS, per Ton.
Average Weight of Cast Iron Gas Pipes, per Yard.

1½ in.	2 in.	2½ in.	3 in.	4 in.	5 in.	6 in.	7 in.	8 in.	9 in.	10 in.	12 in.
16	21	28	33	51	70	89	107	126	149	177	208 lbs.

Retail Prices are 5 to 10 per cent. higher.	London.	Glasgow	Newcastle.	Wales.	Yorksh., Derbysh., and Staffdsh.
	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.
Pig Iron, No. 1.	5 0 0	4 5 0	4 5 0	4 10 0	4 15 0
1½ and 2 inches Socket Pipes	8 17 6	8 0 0	8 0 0	8 5 0	8 5 0
2½ and 3 do. do.	8 12 6	7 15 0	7 15 0	8 0 0	8 0 0
4 and 5 do. do.	8 7 6	7 10 0	7 10 0	7 15 0	7 15 0
6 inches and upwards do.	8 2 6	7 5 0	7 5 0	7 7 0	7 10 0
Extra for bends, branches, and connection	2 10 0	2 10 0	2 10 0	2 10 0	2 10 0
Retorts, 2nd fusion, hot blast	8 3 0	7 2 6	7 2 6	7 7 6	7 7 6
Do. 2nd fusion, cold blast	8 10 0	..	7 12 6	7 17 6	7 17 6
Tank Plates, ¾ thick and above	8 5 0	7 7 6	7 7 6	7 12 6	7 12 6
Do. less than ¾	8 15 0	7 15 0	7 15 0	8 0 0	8 0 0
Plain Castings ex. models	8 10 0	7 12 6	7 12 6	7 17 6	7 17 6

COALS.

NEWCASTLE.	s. d.		DERBYSHIRE.		
Unscreened.			Clay Cross, Deep Main, and New Birchwood	8s.6d. per ton.	
Whitwell Primrose	7 6	per ton.	SCOTCH CANNEL.		
Dean's Primrose	8 0	,,	Boghead ....at Leith	27 0	,,
Pelton		,,	Kirkness.....best	23 5	,,
Brancepeth		,,	Capeldrae, first quality	20 0	,,
Medomsley		,,	Ditto, second quality	12 6	,,
Pelaw	8 3	,,	Lothian	20 0	,,
Burnhope		,,	Lesmahago at Glasgow	23 0	,,
Eighton Moor		,,	Ditto at Grangemouth	25 0	,,
Felling Main		,,	Arniston	22 0	,,
New Pelton		,,	Wemyss ...(at the pits)	16 0	,,
Peareth	8 6	,,	Bridgeness	17 0	,,
South Pelaw		,,	Kinneil		,,
Waldridge		,,	Knightswood	18 0	,,
Washington Hutton		,,	Lochgelly	12 6	,,
South Peareth		,,	Lumphinan		,,
Ramsay's Cannel	16 0	,,	Methill	11 0	,,
Cowen's Cannel	16 0	,,			

FIRE GOODS.
Best Bricks, 60s. per 1000, at Newcastle.
Do. Clay, 14s. per ton do.

LEAD.
Soft pig, £24 to £25 per ton.

WROUGHT IRON TUBING, subject to 25 per cent. Discount.

	2 inches.	1½ inch.	1¼ inch.	1 inch.	¾ inch.	½ inch.
	s. d.	s. d.	s. d.	s. d.	s. d.	s. d.
Patent welded tubes, from 2 to 12 feet, per foot	1 8	1 0	0 10	0 7	0 5	0 4½
Ditto .... ,, 6 in. to 18 in., each	3 0	2 0	1 9	1 3	1 0	0 9
Connecting pieces, or long screws	3 6	2 3	2 0	1 6	1 2	0 11
Bends, springs, and elbows, wrought iron	3 9	2 3	1 9	1 0	0 10	0 8
Tees, wrought or cast	4 0	2 6	2 0	1 6	1 1	0 10
Crosses, wrought or cast	4 6	3 0	2 6	2 0	1 6	1 2
Iron cocks	17 6	9 6	7 6	4 6	3 3	2 6
Ditto, with brass plug	28 0	16 0	13 0	7 0	5 6	4 6
Diminishing sockets, caps, plugs, and nipples	1 3	0 9	0 8	0 6	0 5	0 4
Plain sockets	1 0	0 8	0 7	0 5	0 4	0 3
Flanches	1 9	1 6	1 3	1 0	0 9	
Syphons, 2 quart	15 0	14 0	13 6	13 0	12 0	
Ditto 1 quart	11 6	10 6	10 3	10 0	9 6	

FREIGHTS, per Ton.

Coastwise—Newcastle.	8s.0d	*Foreign.*	8s.9d
Chatham & Roches.		Boulogne	
Cork	12 6	Barcelona	28 0
Dover	9 0	Bordeaux	17 0
Dublin	12 6	Cadiz	16 0
Exeter Quay	11 0	Calais	9 0
Folkestone	8 9	Constantinople	30 0
Hastings	10 6	Dieppe	10 6
Jersey	11 0	Genoa	26 0
London	8 6	Hamburg	11 0
Lowestoft & Yarmth	6 0	Havanna	20 0
Lynn	8 0	Havre	11 6
Margate	9 0	Leghorn	27 0
Portsmouth	10 6	Lisbon	16 0
Plymouth	10 6	Rotterdam	11 0
Whitstable	8 6	Stettin	10 0
Weymouth	11 0	Trieste and Venice	30 0

Advertisements.

To MERCHANTS, GAS AND WATER COMPANIES, ENGINEERS, &c.

JOSEPH BARNSLEY and CO.,

PATENT WELDED WROUGHT IRON TUBE WORKS, OLD HILL, NEAR DUDLEY,

Beg to call attention to the very great superiority of their fittings, in finish, screwing, &c. Their tubes are equal in strength and quality of iron to those of any other manufacturer.

Price lists may be obtained, and samples inspected, on application to the Works as above, or to their Agent, Mr. H. E. ALPORT, 14, WALBROOK, LONDON.

WORTLEY FIRE BRICKS, GAS RETORTS, &c.

THE Farnley Iron Company respectfully call the attention of gas companies, proprietors, managers, and gas engineers, to their manufacture of FIRE BRICKS, GAS RETORTS, &c., from the best Wortley bed of Fire Clay—well known in the Forges, Potteries, and Glass Houses of Lancashire, Yorkshire, and Lincolnshire. A trial of these goods is solicited. Orders to any extent for Fire-clay goods of every description, Patent Glazed Sanitary Tubes, Terra Cotta Chimney Tops, &c., can be undertaken and prices quoted, on application to the FARNLEY IRON COMPANY, Wortley, near LEEDS.

THOMAS EDINGTON,
late of the PHŒNIX IRON WORKS, GLASGOW,
IRON MERCHANT,
Contractor, Inspector of Railway Bars and Castings, Agent for Patents, General Commission Agent.
Wanted—Agencies for the sale, on commission, of English Boiler and Ship Plates, Angle and Rivet Iron, Tinned Plates, &c.
17, GORDON-STREET, GLASGOW.

25, CHARLOTTE STREET, BLACKFRIARS ROAD, NEAR SURREY CHAPEL.

JOHN WINN

Begs to inform the public that he has had great experience, for many years, as a GAS APPARATUS MANUFACTURER, and, being favoured with a very extensive connection, respectfully invites an inspection of his Stock: it comprises Gas Chandeliers, Pendants, Brackets, Gas Cooking Apparatus, Gas Stoves, and a very simple process of warming Conservatories by gas; and his newly invented Ventilator, suitable for private and public buildings (particularly recommended for invalids' chambers), parlours, taprooms, &c.

☞ J. WINN would also direct attention to his PATENT HORSE SINGER, of which he is the sole manufacturer; patronised by his Royal Highness Prince Albert, and many others too numerous to mention.

GAS.—The Barnet and Chertsey GAS WORKS to be SOLD—together or separately—for one-third less than their cost. Apply to Mr. C. T. HOLCOMBE, the Proprietor, No. 10, BROAD-STREET-BUILDINGS, CITY, who is retiring from business.

PATENT GAS METER MANUFACTORY,
No. 66, Snow-hill, London.

WILLIAM SMITH, by the improvements he has made in the Wet Meter, and which he has secured by her Majesty's Royal Letters Patent, the accuracy of their registry is rendered certain by the introduction of the adjusting slide and hydraulic, whereby a Perfect Water Level is readily obtained, and the Hydraulic precludes the possibility of abstracting water from the meter by increased pressure or otherwise, thus surmounting the great desideratum of the Wet Meter. In his Patent Equitable Gas Meter neatness and strength are combined, the backs and fronts of the case being stamped by powerful machinery out of thick plate iron (tinned or galvanized); and the internal construction is of the best metal, which will resist the action of any impurity in the gas.

Old Meters may readily have the adjusting slide and hydraulic applied, thereby having accurate measurement assured.

Station Meters, Governors, &c., made on the shortest notice.